

Design Course

Photography

Art and Science of Capturing Images

by

Menuolhoulie Kire and Prof. Ravi Mokashi

Punekar

DoD, IIT Guwahati

Source:

<https://dsource.in/course/photography>



1. Cameras and Lenses
2. Camera Features
3. Modes of camera
4. Metering
5. Visual Principles
6. Genres of Photography
7. Photography Examples
8. Contact Details

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<https://dsource.in/course/photography/cameras-and-lenses>

Cameras and Lenses

Components of camera:



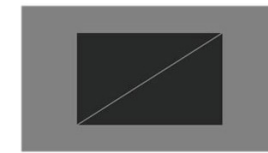
Components of Camera



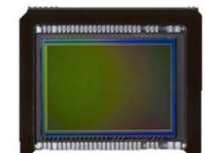
Lens



Aperture

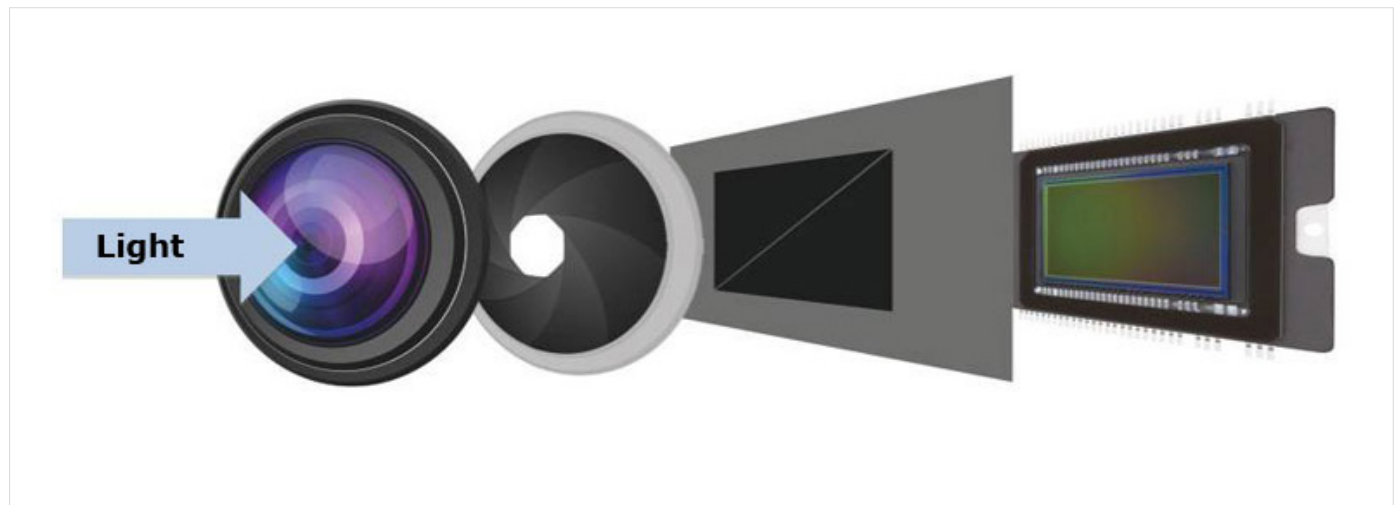


Shutter



Sensor

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Different types of cameras:


Different types of Cameras

Doesn't mean




Canon SONY
Nikon Panasonic
OLYMPUS Leica PENTAX

Different types of Cameras



Point and Shoot Bridge super zooms Four Thirds DSLR (APSC sized sensor)




Full Frame DSLR Medium Format Large Format



Point and shoot

- Small and compact
- Small sensor size
- Limited control
- Easy to use
- LCD screens as principal viewfinder



Bridge superzooms

- Small and compact
- Small sensor size
- Full manual control
- Large zoom range
- Electronic View Finders (EVFs)

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Four Thirds

- Small and compact
- Larger sensor size
- Crop factor of 2
- Full manual control
- Electronic View Finders (EVFs)
- Interchangeable lens



DSLR (APSC sized sensor)

- Bigger and better build
- Larger sensor size than four thirds
- Crop factor of 1.5 or 1.6
- Full manual control
- Optical View Finders (EVFs)
- Interchangeable lens



Full Frame DSLR

- Professional build quality
- Weather seals
- Larger sensor size than APSC sized sensors
- Full manual control
- Optical View Finders (EVFs)
- Interchangeable lens



Medium Format

- Larger sensor size than Full Frame sized sensors
- Full manual control
- Optical View Finders (EVFs)
- Interchangeable lens



Large Format

- Professional build quality
- Larger sensor size than Medium Format sensors
- Full manual control
- Optical View Finders (EVFs)
- Interchangeable lens

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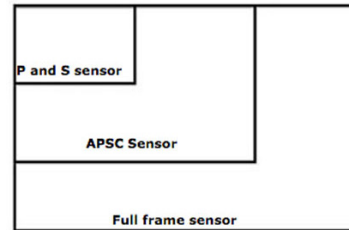
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Image Quality:

MEGAPIXEL VS SENSOR SIZE:

- MEGAPIXEL COUNT IS THE NUMBER OF YOUR PIXEL IN YOUR SENSOR
- SENSOR IS THE SIZE OF ACTUAL PHYSICAL DIMENSIONS OF YOUR SENSOR
- MEGAPIXEL ALONE WON'T GIVE YOU A BETTER IMAGE QUALITY
- SENSOR SIZE MATTERS MORE THAN THE MEGAPIXEL COUNT
- MORE MEGAPIXEL COUNT WILL LET YOU PRINT BIGGER SIZED PRINTS
- MORE MEGAPIXEL IN SMALLER SENSOR WILL RESULT IN MORE NOISE



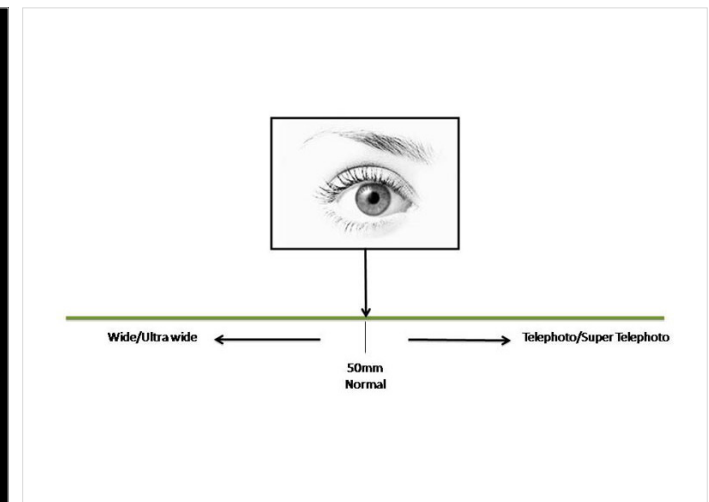
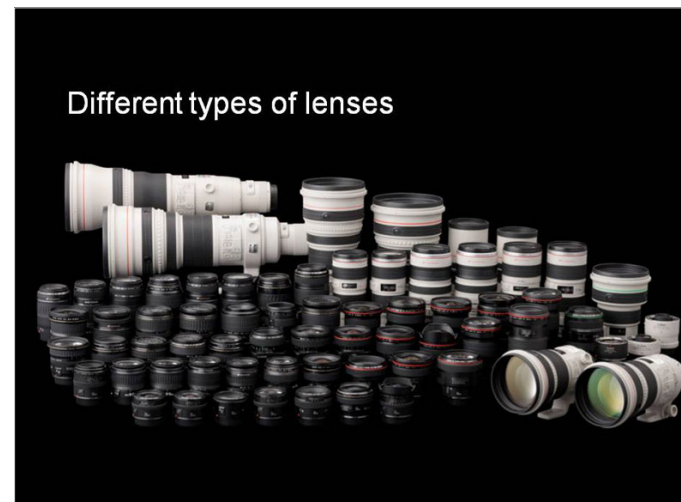
OPTICAL ZOOM VS DIGITAL ZOOM:

- OPTICAL ZOOM IS THE PHYSICAL ZOOM THE OPTICS IN THE CAMERA CAN PERFORM.
- OPTICAL ZOOM IS BETTER THAN DIGITAL ZOOM.
- DIGITAL ZOOM IS THE AMOUNT OF ZOOMING THE CAMERA DOES DIGITALLY.
- DIGITAL ZOOM ONLY ENLARGES THE CENTRE OF YOUR FRAME BY CROPPING.



Different Types of Lenses:

- Wide Lenses
- Normal Lenses
- Telephoto Lenses
- Macro Lenses



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Wide Lenses

- Focal length ranges from 8mm
- Used mainly for landscape
- Can be used to create dynamic portraits



Normal Lens

- Focal length of 50mm
- Mainly a Portraiture lens
- Great for street photography
- All purpose lense
- Gives excellent bokeh



Telephoto Lenses

- Focal length range upwards of 50mm
- Used mainly for wildlife and sports photography
- Can be used for portraits too
- Compresses the perspectives



Macro lenses

- Available in many Focal lengths
- Used mainly for Macro Photography
- Can be used for portraits



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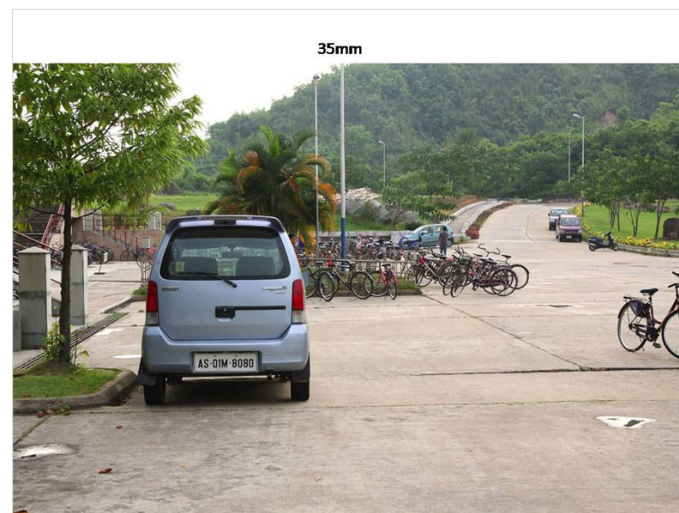
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Prime lenses	Vs	Zoom lenses
<ul style="list-style-type: none">• Fixed focal length• Better image quality• More expensive• Less distortion or Aberrations		<ul style="list-style-type: none">• Variable focal length• Lower image quality• Less expensive• Distortion or Aberrations at the extreme ends of the zoom range• Gives you Flexibility
		



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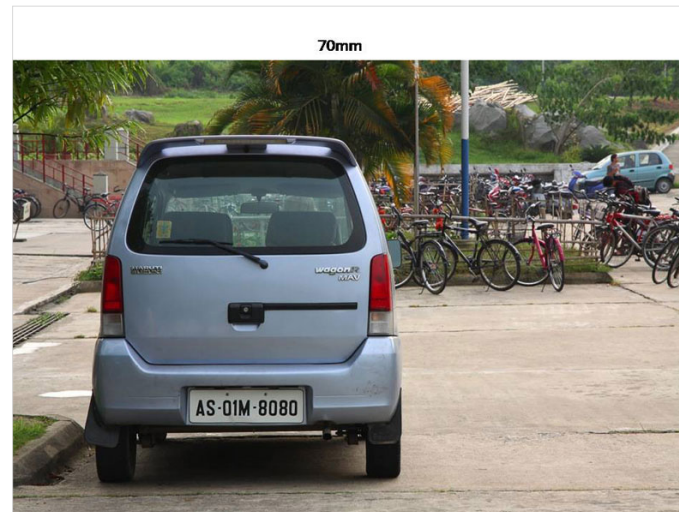
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Camera Features

Different Features explained in detail:

- Aperture
- Shutter Speed
- Bokeh
- ISO
- Noise
- Exposure Compensation
- The water tap story

Aperture:**F/Stops:**

Lens aperture or F/Stop is a hole or an opening through which light travels. It is a ratio, much like a fraction, which is why $f/2$ is larger than $f/4$, just as $\frac{1}{2}$ is larger than $\frac{1}{4}$. However, $f/2$ is actually four times as large as $f/4$. Lenses are usually marked with intermediate f/stops that represent a size that's twice as much/half as much as the previous aperture.

So, a lens might be marked:

$f/2$, $f/2.8$, $f/4$, $f/5.6$, $f/8$, $f/11$, $f/16$, $f/22$.

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APERTURE

- an aperture is a hole or an opening through which light travels
- The aperture stop of a photographic lens can be adjusted to control the amount of light reaching the film or image sensor
- The lens aperture is usually specified as an f-number
- A lower f-number denotes a greater aperture opening which allows more light



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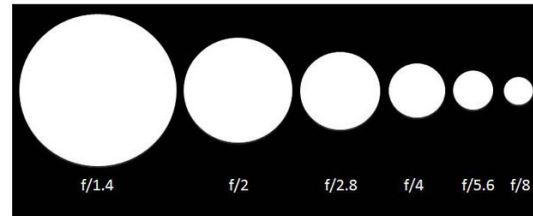
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DEPTH OF FIELD (DOF):



Depth of field (DOF): Is the distance between the nearest and farthest objects in scene that appear acceptably sharp in an image



Small DOF



Large DOF

f/1.8



f/2.8



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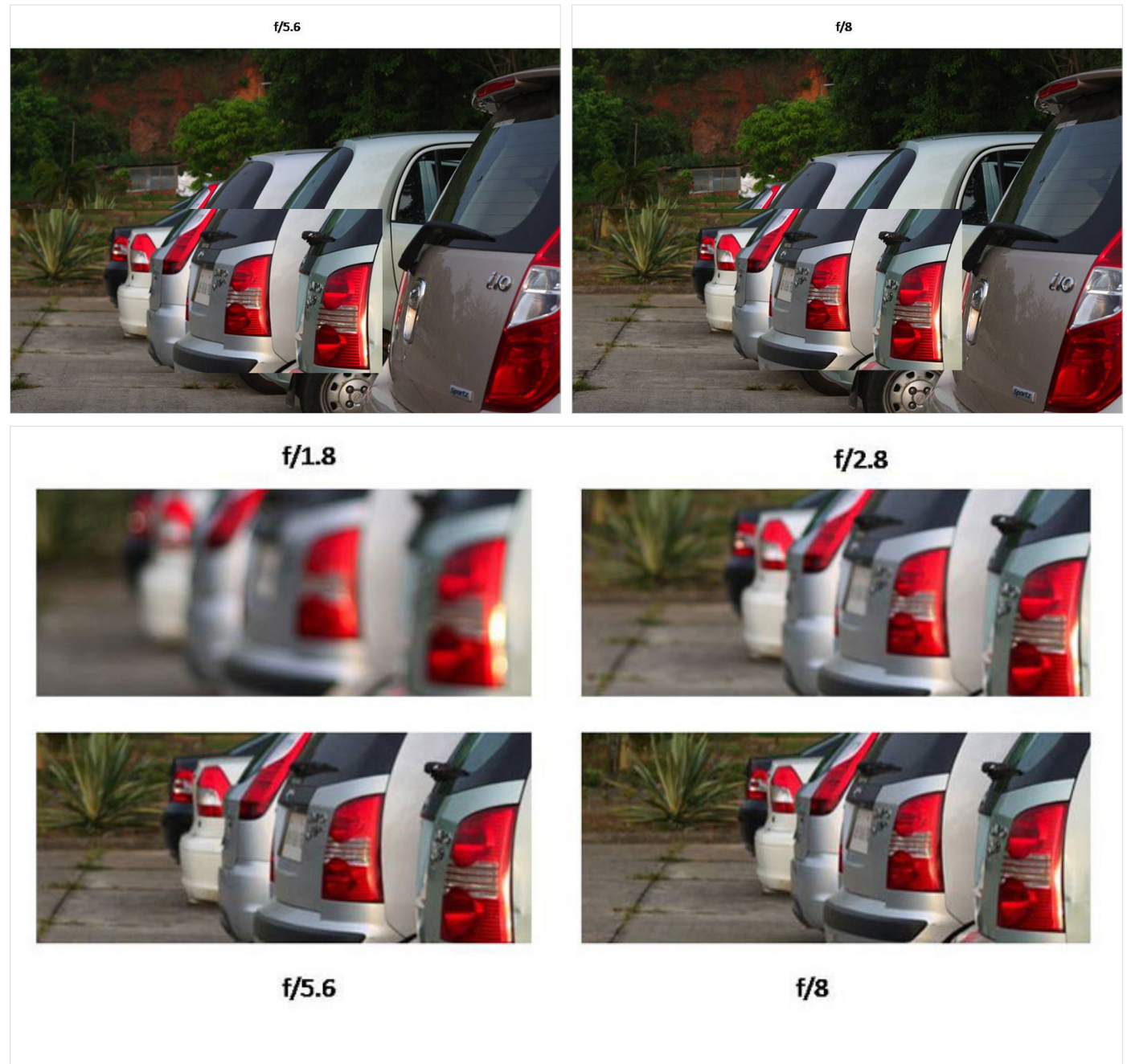
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Shutter Speed:

In still cameras, the term shutter speed represents the time that the shutter remains open when taking a photograph. Shutter speeds are actual fractions (of a second), but the numerator is omitted, so that 60, 125, 250, 500, 1000, and so forth represent 1/60th, 1/125th, 1/250th, 1/500th, and 1/1000th second. To avoid confusion some camera companies use quotation marks to signify longer exposures: 2", 2"5, 4" and so forth represent 2.0, 2.5 and 4.0 second exposures, respectively.

SHUTTER SPEED

- THE EFFECTIVE LENGTH OF TIME A CAMERA'S SHUTTER IS OPEN
- SLOWER SHUTTER SPEEDS ARE OFTEN SELECTED TO SUGGEST MOVEMENT IN A STILL PHOTOGRAPH



1/8000s: USED TO TAKE SHARP PHOTOGRAPHS OF VERY FAST SUBJECTS, SUCH AS BIRDS OR PLANES UNDER GOOD LIGHTING CONDITIONS



1/500s AND 1/250s: USED TO TAKE SHARP PHOTOGRAPHS IN MOTION IN EVERYDAY SITUATIONS



1/15 AND 1/8s: THIS AND SLOWER SPEEDS ARE USEFUL FOR PHOTOGRAPHS OTHER THAN PANNING SHOTS WHERE MOTION BLUR IS EMPLOYED FOR DELIBERATE EFFECT, WITH A TRIPOD SUPPORTED CAMERA.

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B (BULB) (ABOVE 30SEC):
USED FOR CAPTUREING STAR TRAILS AND OTHER CREATIVE EFFECTS. TRIPOD IS A MUST.



1/4s 1/2s AND 1s : ALSO MAINLY USED FOR MOTION BLUR EFFECTS BUT ONLY PRACTICAL WITH A TRIPOD SUPPORTED CAMERA.



1/30s: USED FOR IMAGES TAKEN AT THIS AND SLOWER SPEEDS NORMALLY REQUIRE A TRIPOD



1/500s AND 1/250s: USED TO TAKE SHARP PHOTOGRAPHS IN MOTION IN EVERYDAY SITUATIONS



1/2000s AND 1/1000s: USED TO TAKE

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Bokeh:

Bokeh describes the aesthetic qualities of the out-of-focus parts of an image, and whether out-of-focus points of light- circles of confusion- are rendered as distracting fuzzy discs, or whether they smoothly fader into the background. Bokeh is a Japanese word for “blur”, and the h was added to keep English speakers from rendering it monosyllabically to rhyme with broke. Although bokeh is visible in blurry portions of any image, it's of particular concern with telephoto lenses, which, thanks to the magic of reduced depth-of-field, produce more obviously out-of-focus areas.

bokeh: Is the blur, or the aesthetic quality of the blur, in out-of-focus areas of an image, or "the way lense renders out-of-focus points of light."

**ISO:**

A digital camera's sensitivity to light is measured using ISO. As ISO rating increases, the camera becomes more light sensitive, and a more light-sensitive camera offers different creative possibilities. In addition to allowing you to shoot using less light, a higher ISO rating allows you to use smaller apertures and higher shutter speeds when shooting bright day light.

ISO

- ISO is actually a common short name for the International Organisation for Standardization.
- The number refers to the film's sensitivity to light
- More number = Higher sensitivity
- Better quality images are achieved with a lower ISO number



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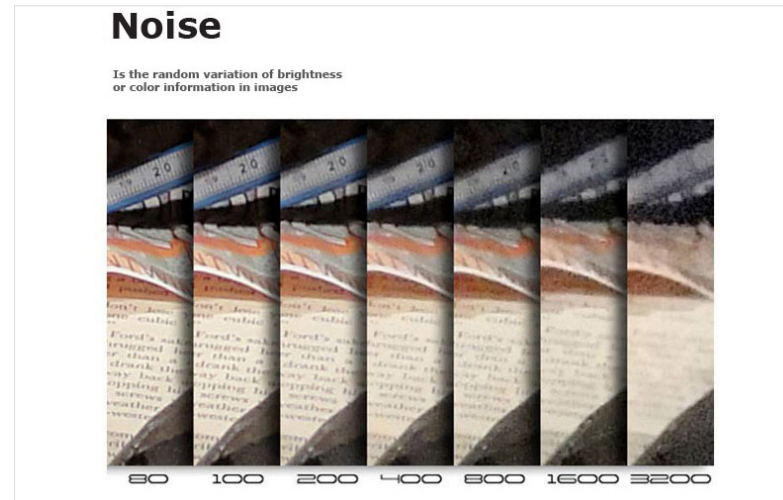
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Noise:

Image noise is that random grainy effect that some like to use as a visual effect, but which, most of the time, is objectionable because it robs your image detail even as it adds that “interesting” texture. Noise is caused by two different phenomena: high ISO setting and long.



Exposure Compensation:

The amount of light allowed to reach the film or sensor, determined by the intensity of the light, the amount admitted by the iris of the lens, and the length of time determined by the shutter speed.

EXPOSURE COMPENSATION
IS A TECHNIQUE FOR ADJUSTING THE EXPOSURE INDICATED BY A PHOTOGRAPHIC EXPOSURE METER IT'S USED WHEN INDICATED EXPOSURE TO RESULT IN A LESS-THAN-OPTIMAL IMAGE IT'S ALSO USED FOR INTENDED UNDEREXPOSURE OR OVEREXPOSURE

WHITE as WHITE

The camera meters WHITE as GREY

An exposure compensation of +1.5 is needed to render the WHITE as WHITE

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BLACK as BLACK

camera meters BLACK as NOT SO BLACK


exposure compensation of -1.5 is needed to render the BLACK as BLACK



Before After

Light BACKGROUND or Backlit Subject

+VE Exp. Compensation is Required



Before After

-VE Exp. Compensation is Required



Before After

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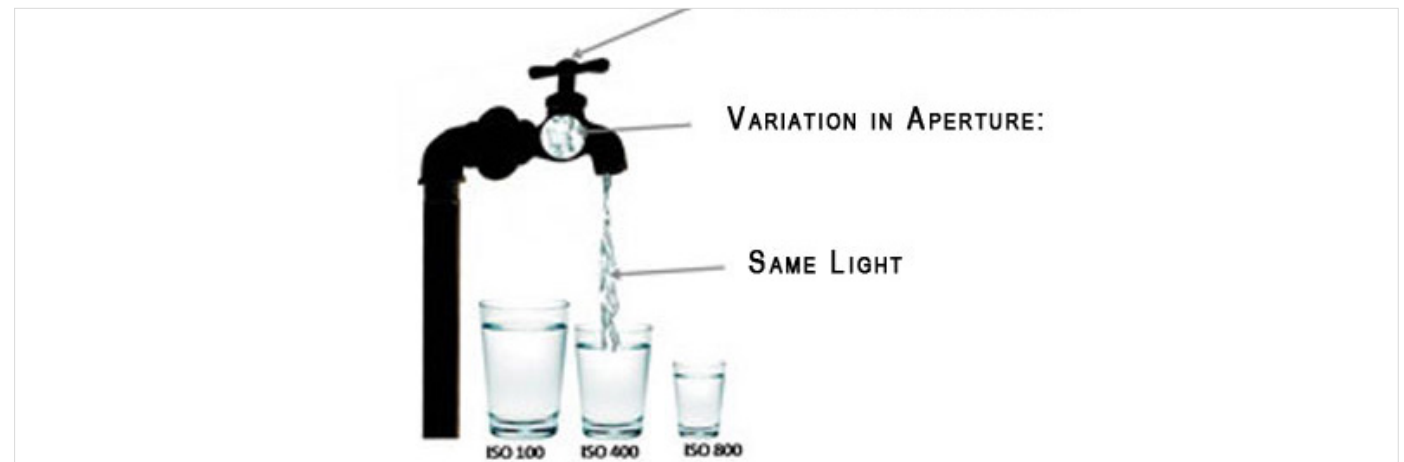
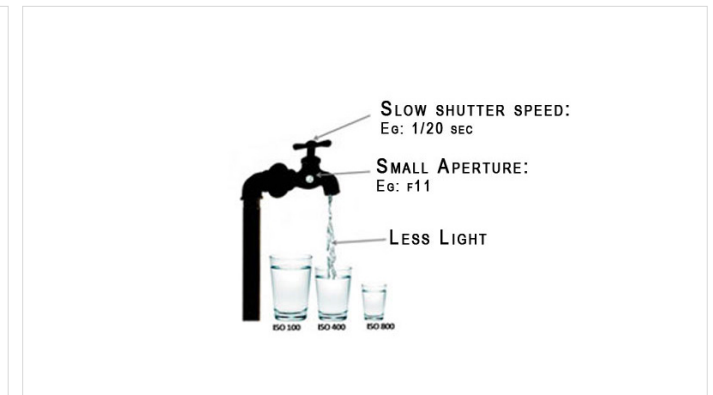
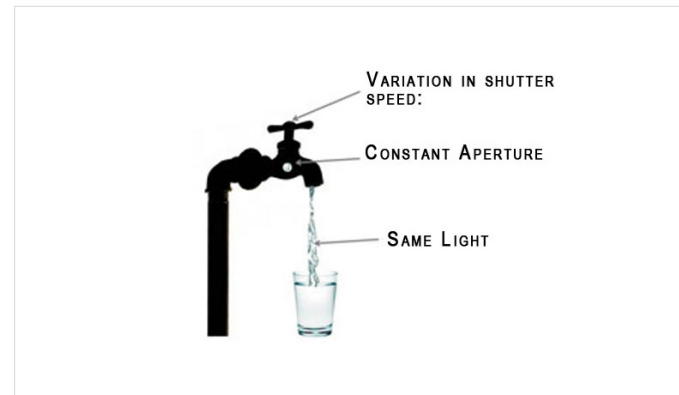
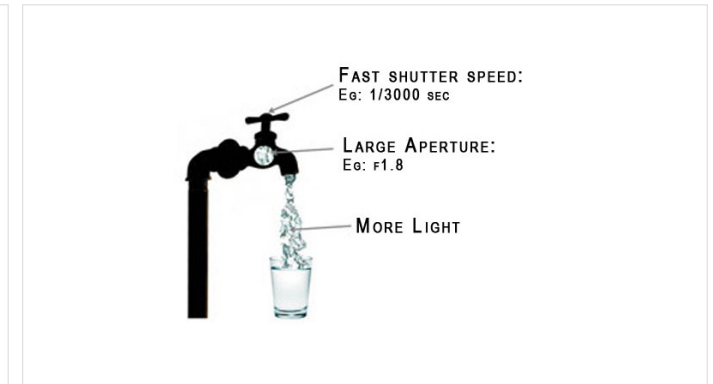
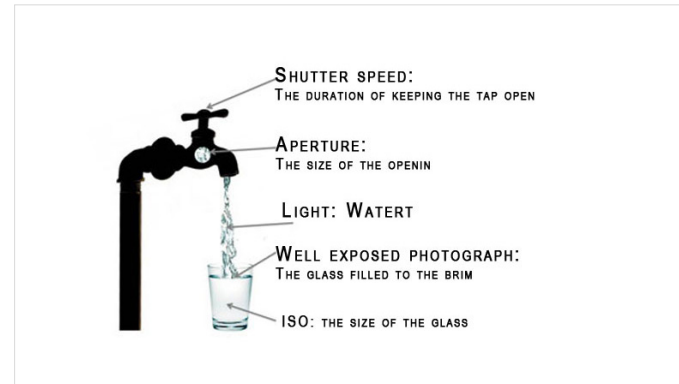
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The water tap story:



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Modes of camera

Work with Modes:

Different types of Modes:

- Macro Mode
- Landscape Mode
- Night Portrait
- Portrait Mode
- Program Mode
- Shutter Priority
- Aperture Priority
- Manual
- Sports Mode

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KNOW YOUR MODES



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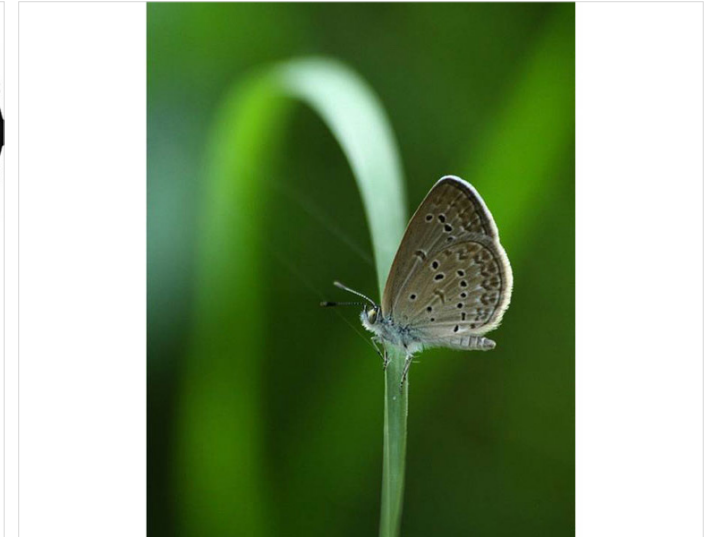
Macro Mode:

This mode is helpful when you are shooting close-up pictures of a subject from about one foot away or less.

MACRO MODE →




- ALLOW YOU TO MOVE CLOSER TO YOUR SUBJECT
- WORKS BEST WHEN SHOOTING A SINGLE SUBJECT
- IDEAL FOR SHOOTING SMALL SUBJECTS LIKE INSECTS, FLOWERS ETC



Landscape Mode:

This mode is when you want extra sharpness and rich colors of distant scenes.

LANDSCAPE MODE →



- INCREASES F-STOP FOR A LARGER DEPTH OF FIELD
- INCREASES THE COLOUR SATURATION LEVELS IN BLUES AND GREENS
- IDEAL FOR SHOOTING LANDSCAPES



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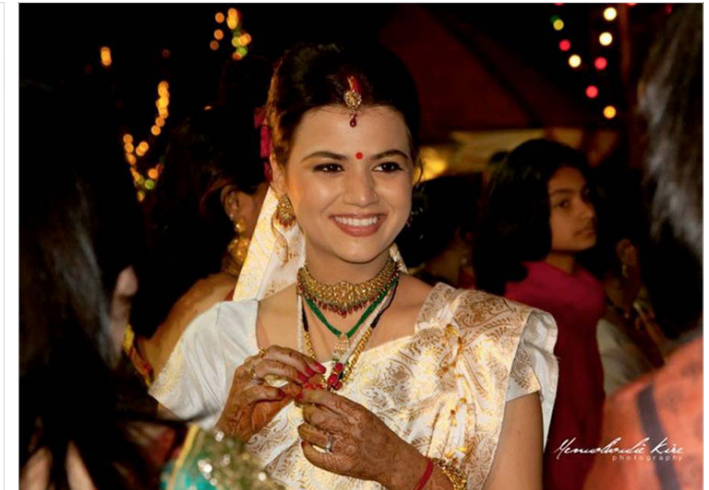
Night Portrait:

This mode is selected when you want to illuminate a subject in the foreground with flash, but still allow the background to be exposed properly by the available light. Be prepared to use a tripod or an image stabilized (IS) lens to reduce the effects of camera shake.

NIGHT MODE →




- REDUCE APERTURE FOR A SHALLOWER DEPTH OF FIELD
- FIRES A SLOW SYNC FLASH TO LIGHT UP THE SUBJECT
- CHOOSES A SLOWER SHUTTER SPEED TO CAPTURE THE AMBIENT LIGHTING
- IDEAL FOR SHOOTING PORTRAITS AT NIGHT



Portrait Mode:

This mode is used when you are taking a portrait of a subject standing relatively close to the camera and want to de-emphasize the background, maximize sharpness, and produce flattering skin tones.

PORTRAIT MODE →



- REDUCE APERTURE FOR A SHALLOWER DEPTH OF FIELD
- SOFTEN THE COLOUR TONE FOR MORE PLEASING SKIN TONES
- WORKS BEST WHEN SHOOTING A SINGLE SUBJECT
- IDEAL FOR SHOOTING PORTRAITS



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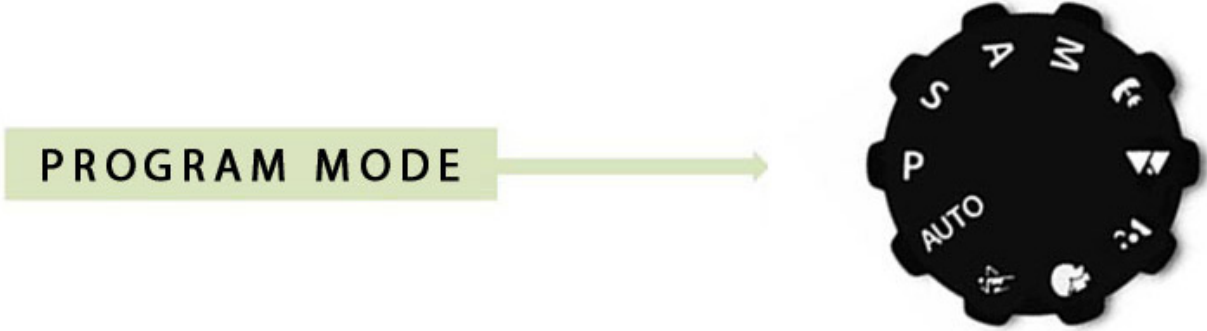
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Program Mode:

Program mode (P) uses camera's built-in smarts to select the correct f/stop and shutter speed using a database of picture information that tells it which combination of shutter speed and aperture will work best for a particular photo. This mode allows the camera to select the basic exposure settings, but you can still override the camera's choices to fine-tune your image.



PROGRAM MODE

- SETS THE APERTURE AND SHUTTER SPEED AUTOMATICALLY
- EXPOSURE COMPENSATION CAN BE USED TO TWEAK THE EXPOSURE
- ALLOWS YOU TO CHANGE ISO VALUES

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Shutter Priority:

Shutter priority is the inverse of aperture priority: you choose the shutter speed you would like to use, and the camera's metering system selects the appropriate f/stop. This mode is useful when you want to use a particular shutter speed to stop action or produce creative blur effects. The camera will select the appropriate f/stop for you.



SHUTTER PRIORITY →

- ALLOWS YOU TO CHANGE SET THE SHUTTER SPEED
- CHANGES THE APERTURE VALUE TO ACHIEVE THE CORRECT EXPOSURE
- EXPOSURE COMPENSATION CAN BE USED TO TWEAK THE EXPOSURE
- IDEAL FOR SHOOTING SPORTS AND FREEZING ACTIONS



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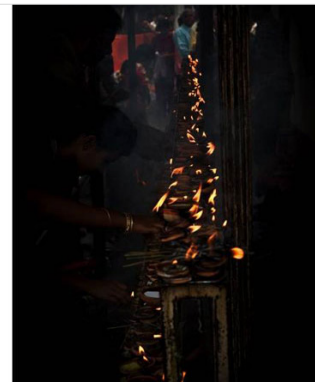
Aperture Priority:

In this mode you specify the lens opening used, and the camera selects the shutter speed. Aperture priority is especially good when you want to use a particular lens opening to achieve a desired effect. This mode is useful especially for controlling sharpness or how much of your image is in focus. The camera will select the appropriate shutter speed for you.

APERTURE PRIORITY →



- **ALLOWS YOU TO CHANGE SET THE APERTURE**
- **CHANGES THE SHUTTER SPEED TO ACHIEVE THE CORRECT EXPOSURE**
- **EXPOSURE COMPENSATION CAN BE USED TO TWEAK THE EXPOSURE**
- **THE MAIN PURPOSE OF USING APERTURE-PRIORITY MODE IS TO CONTROL THE DEPTH OF FIELD**



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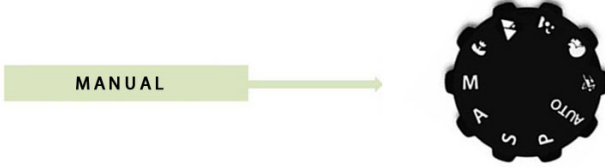
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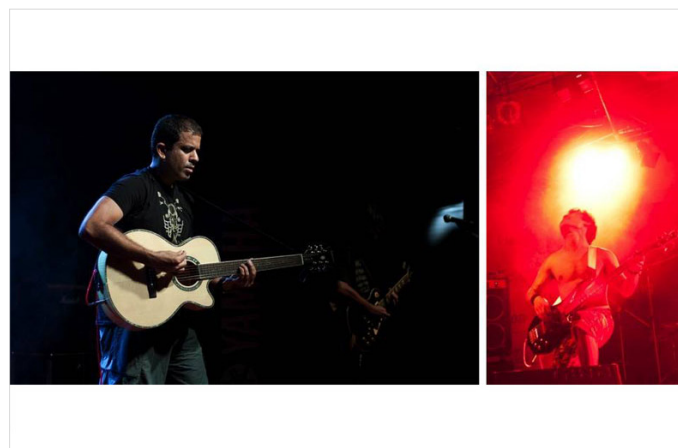
<https://dsource.in/course/photography/modes-camera>**Manual:**

This mode is selected when you want full control over the shutter speed and lens opening, either for creative effects or because you are using a studio flash or other flash unit not compatible with the camera's automatic flash metering.



MANUAL →

- ALLOWS YOU TO CHANGE SET THE APERTURE AND SHUTTER SPEED VALUES
- IDEAL FOR MIXED LIGHTING SITUATIONS
- GIVES YOU MAXIMUM CREATIVE CONTROL
- SET THE APERTURE VALUE AS PER THE REQUIRED DOF
- CHANGE THE SHUTTER SPEED TO GET THE EXPOSURE YOU WANT
- GOOD FOR SHOOTING PANORAMAS



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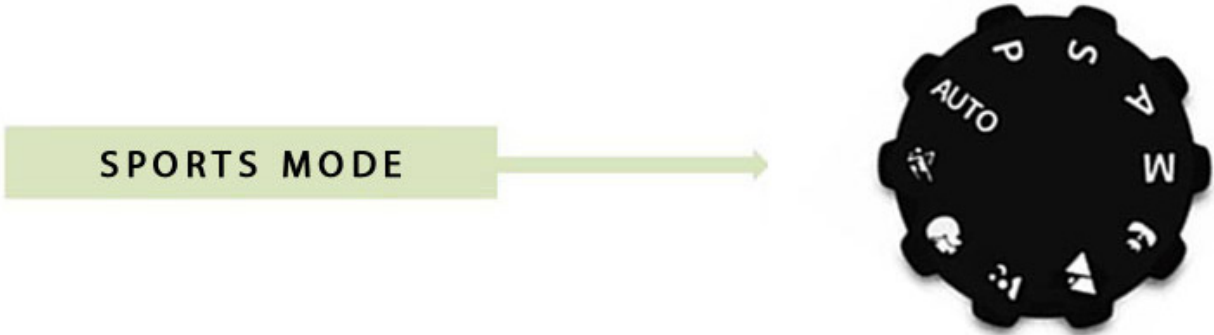
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Sports Mode:

This mode is used to freeze fast moving subjects.



- INCREASE ISO VARIABLY TO HIGHER SETTING
- REDUCE APERTURE FOR A SHALLOWER DEPTH OF FIELD
- INCREASES SHUTTER SPEED TO HELP STOP FAST ACTION
- ADJUST FOCUS MODE TO ADAPTIVE OR ARTIFICIAL SERVO



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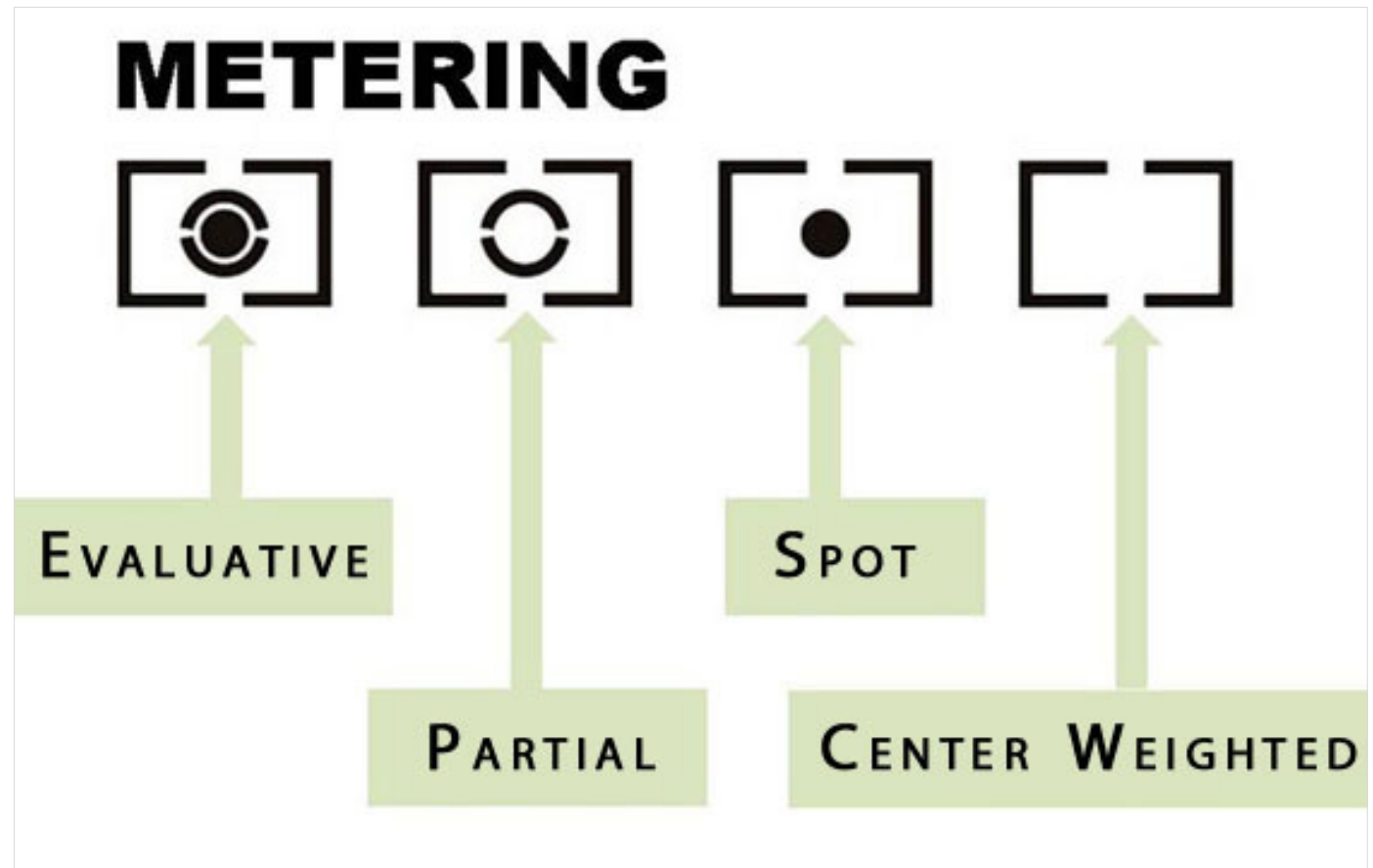
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Metering

Types of Metering:

- Evaluative Metering
- Partial Metering
- Spot Metering
- Center-Weighted Average Metering



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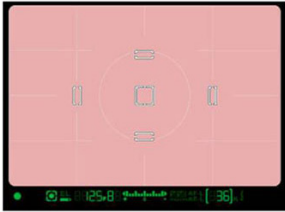
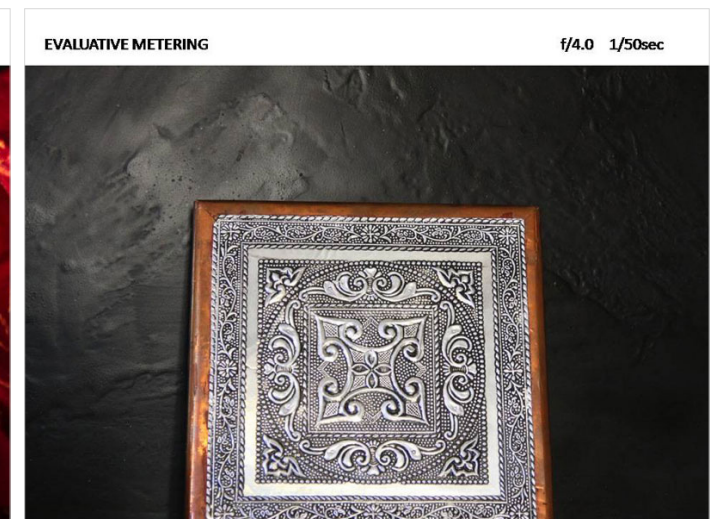
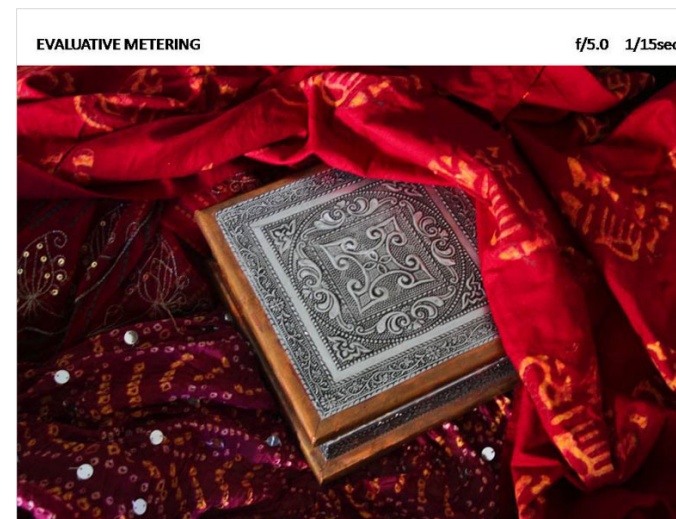
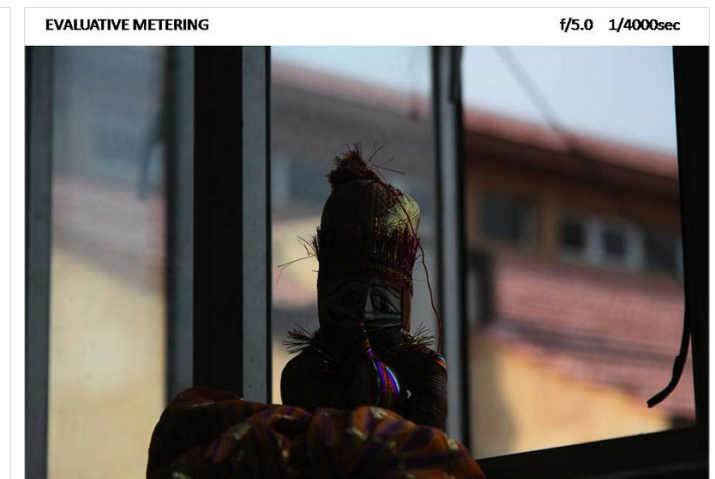
Evaluative Metering:

EVALUATIVE METERING



EVALUATIVE METERING

- General purpose metering mode
- The camera attempts to take into consideration everything in your frame
- It assesses overall lighting from all parts of the scene and takes a best guess by averaging them to decide on how to expose the shot.

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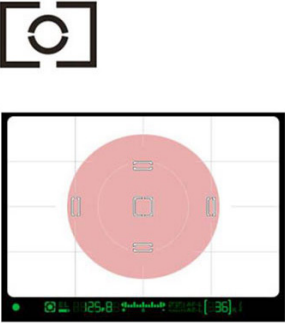
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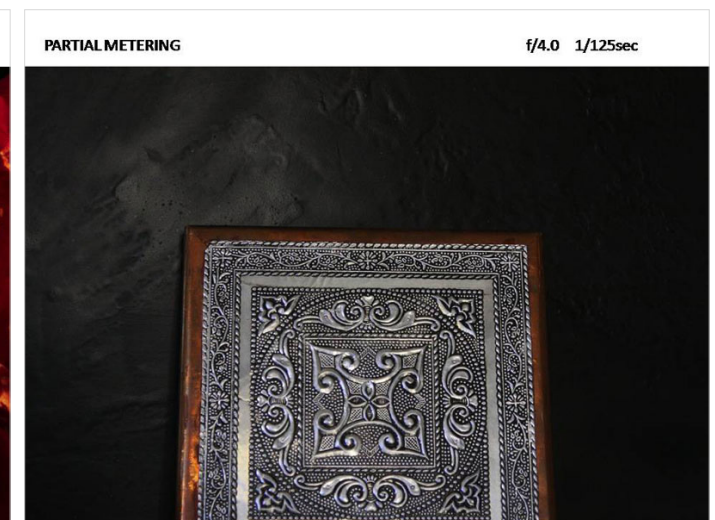
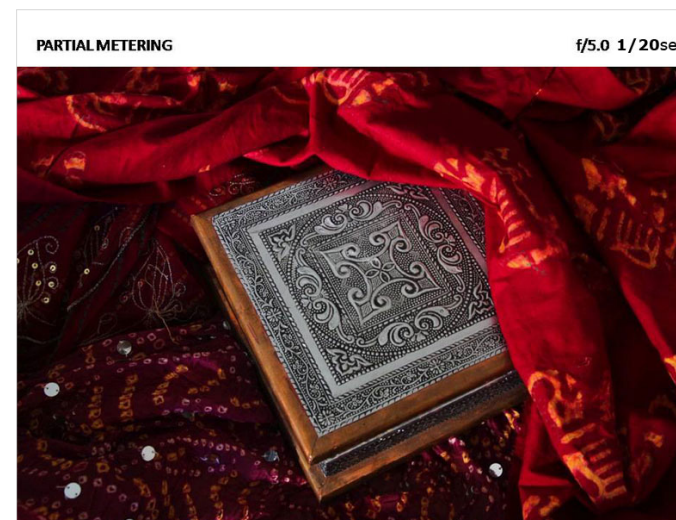
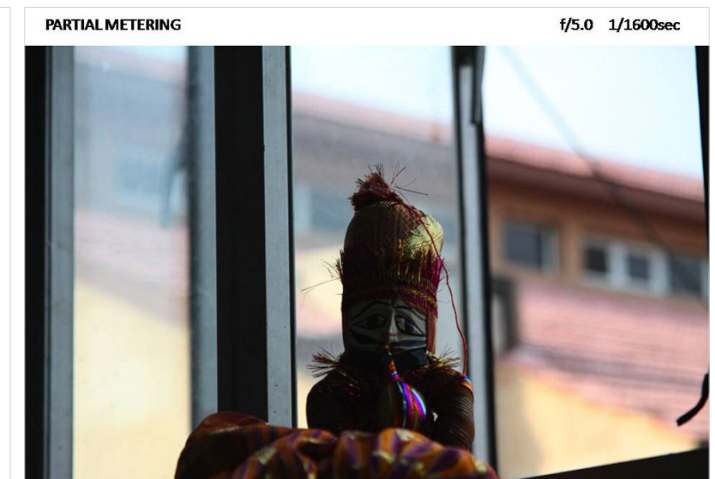
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Partial Metering:

PARTIAL METERING



- when your subject is strongly or overly backlit.
- Covers about 9.4% of the viewfinder area



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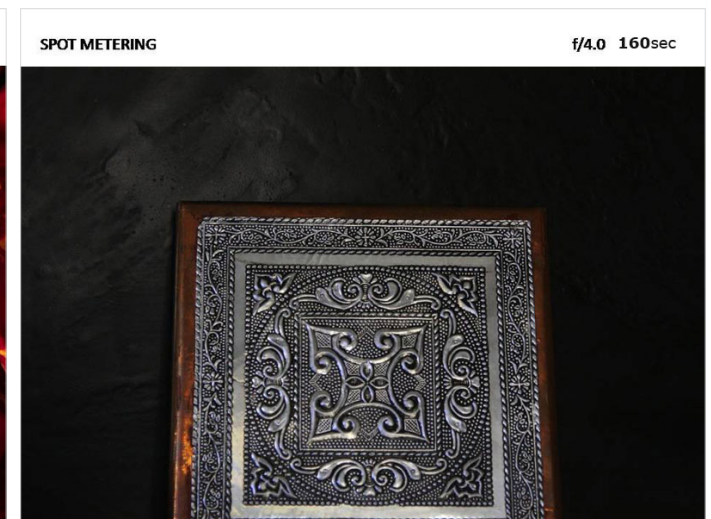
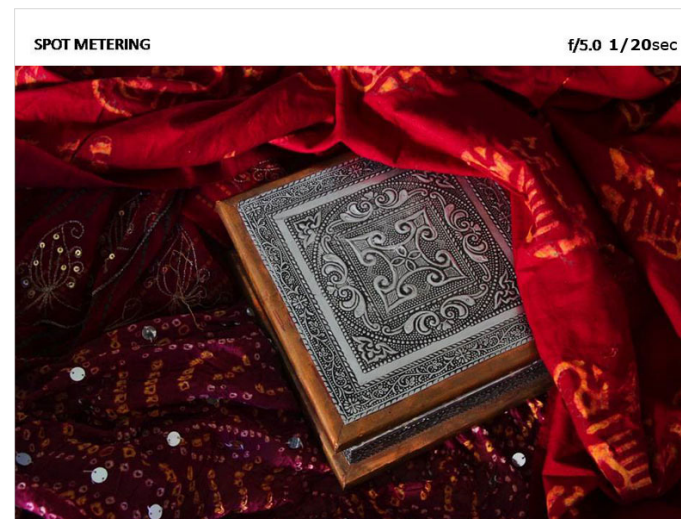
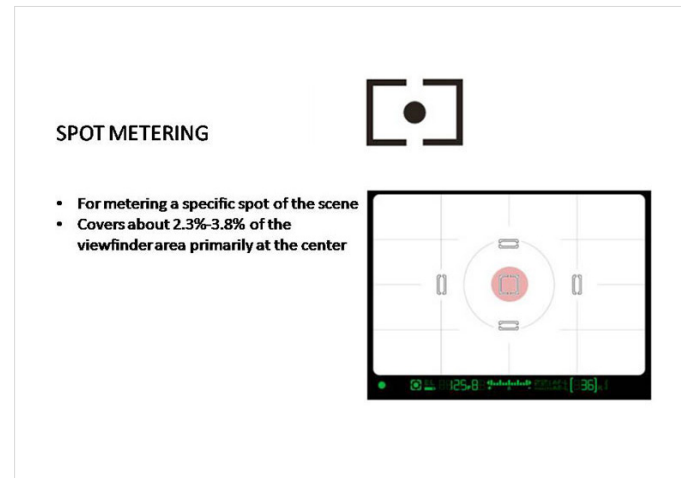
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Spot Metering:



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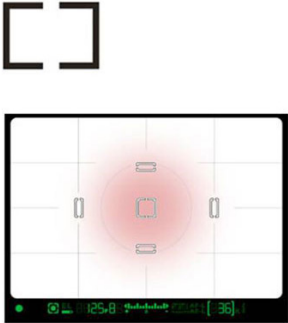
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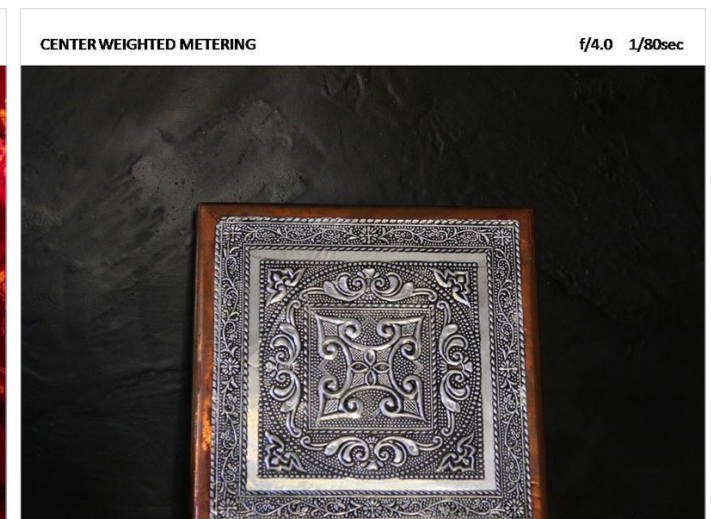
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Center-Weighted Average Metering:

CENTER-WEIGHTED AVERAGE METERING



- Metering is weighted at the center and then average for entire scene



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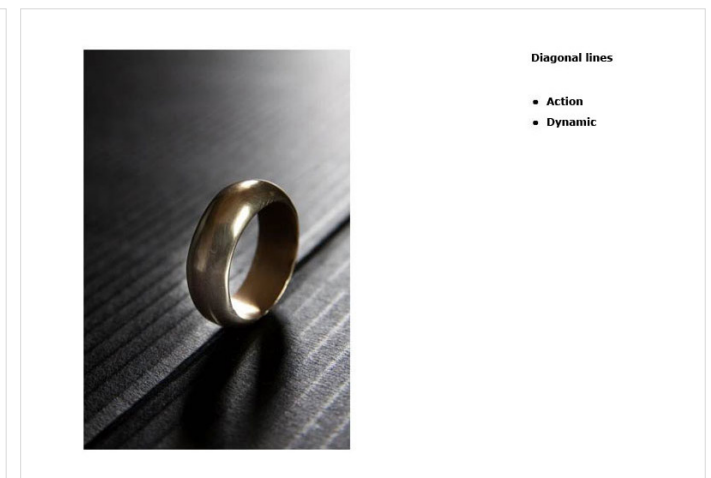
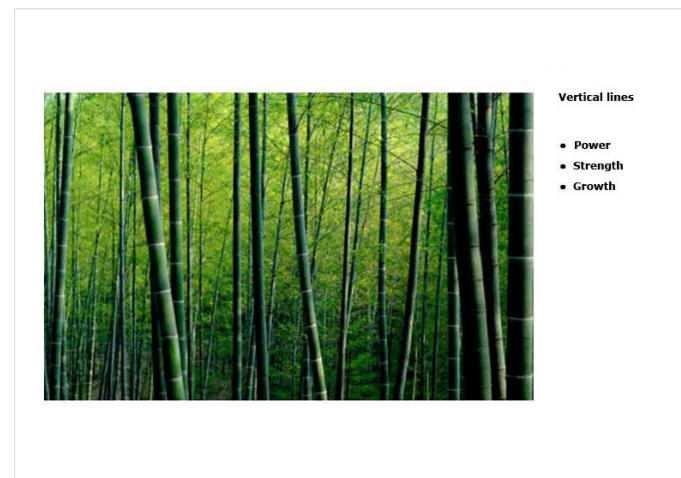
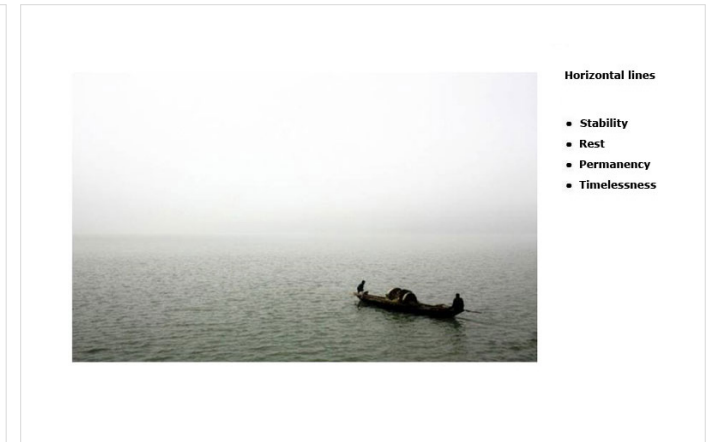
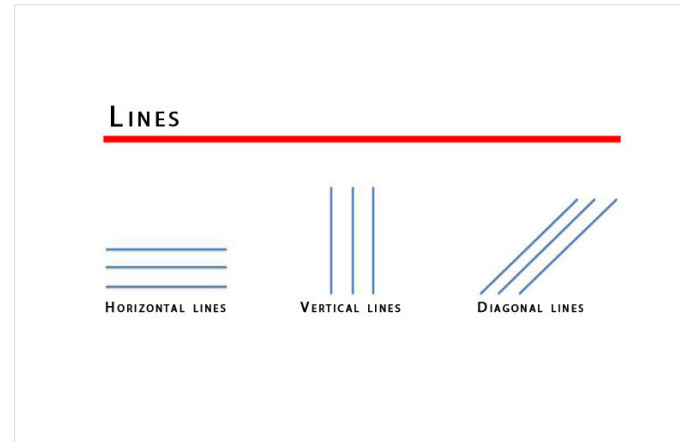
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Visual Principles

Basic Visual Principals:

- Lines
- Frames
- Orientation
- Rule of Thirds
- Dynamic Symmetry

Lines:



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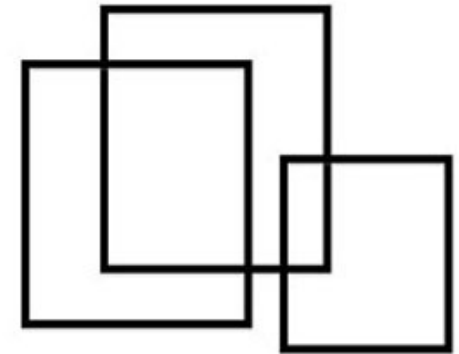
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Frames:

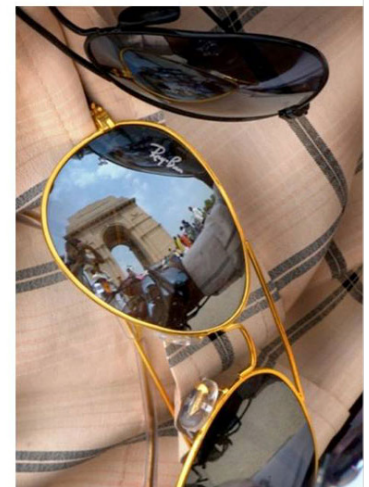
FRAMES

FRAMING IS THE TECHNIQUE OF DRAWING ATTENTION TO THE SUBJECT OF YOUR IMAGE BY BLOCKING OTHER PARTS OF THE IMAGE WITH SOMETHING IN THE SCENE

- GIVING THE PHOTO CONTEXT
- GIVING IMAGES A SENSE OF DEPTH AND LAYERS
- LEADING THE EYE TOWARDS YOUR MAIN FOCAL POINT
- INTRIGUING YOUR VIEWER



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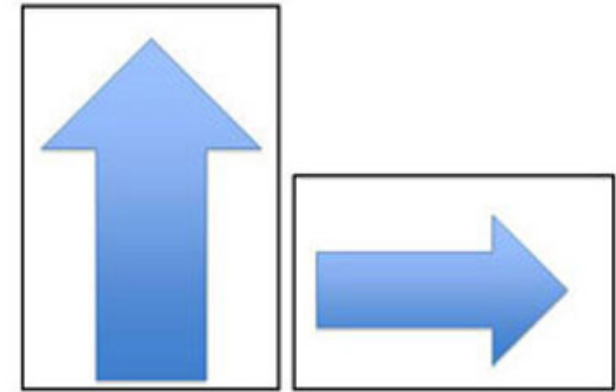
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Orientation:

ORIENTATION



ORIENTATION ACCENTUATES YOUR COMPOSITION

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Vertical/Portrait Orientation



- Tall subjects
- Portraits
- Creates a sense of height

Horizontal/Landscape Orientation



- Wide subjects
- Landscapes
- Creates a sense of vastness

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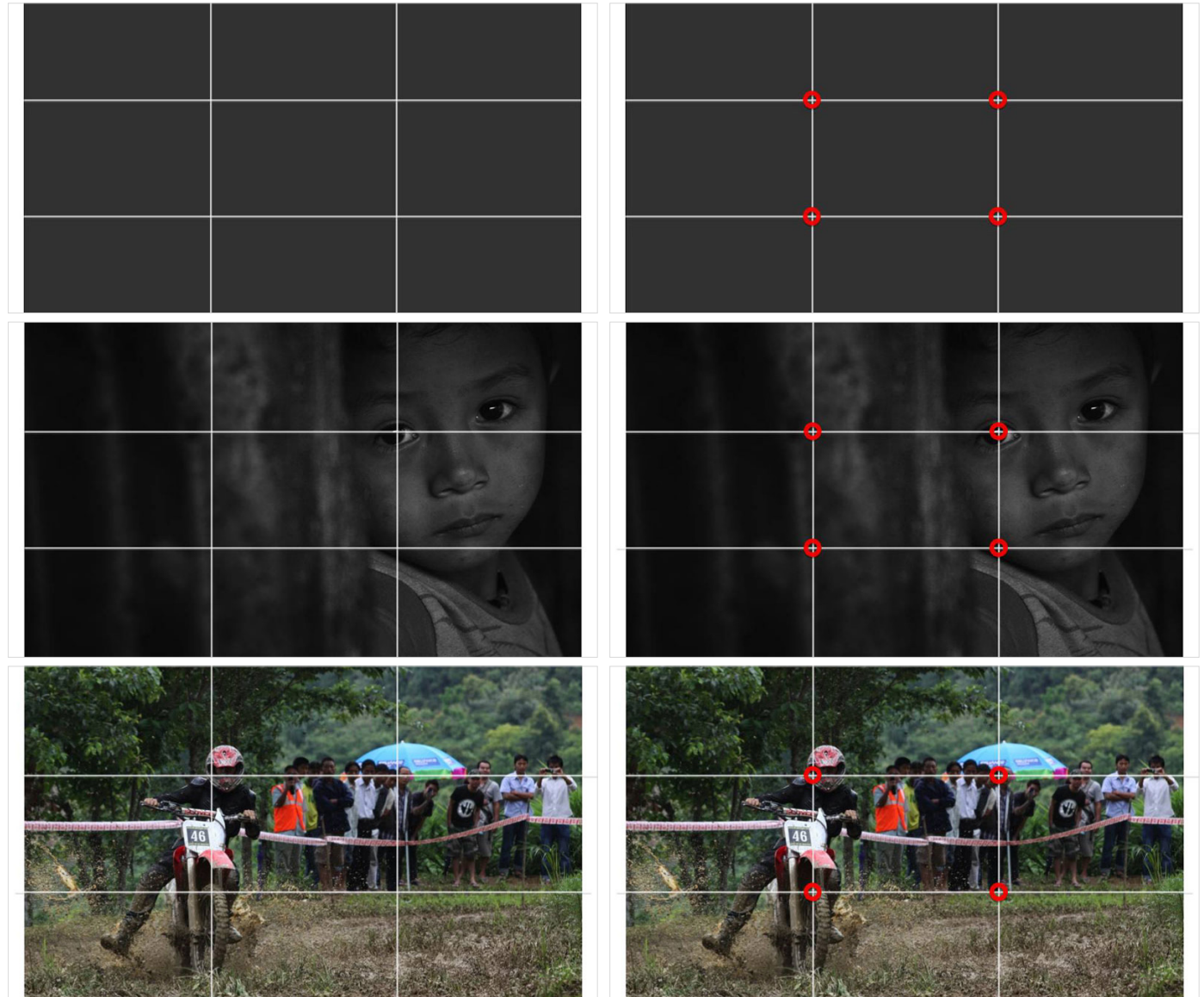
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Rule of Thirds:

An image should be imagined as divided into nine equal parts by two equally-spaced horizontal lines and two equally-spaced vertical lines, and that important compositional elements should be placed along these lines or their intersections.



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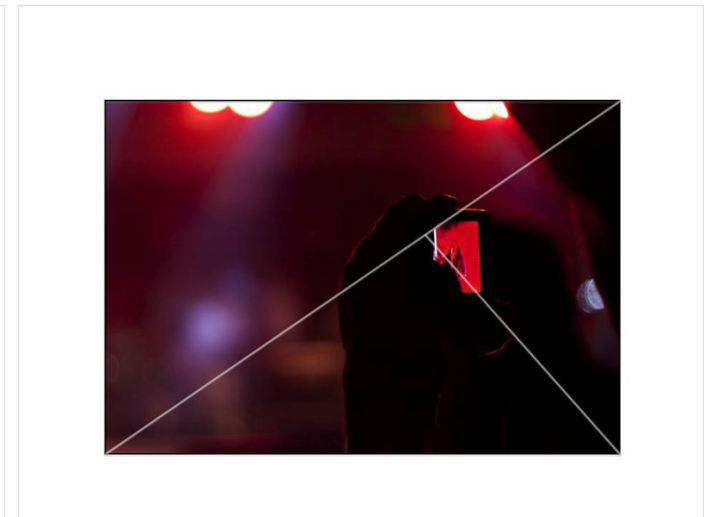
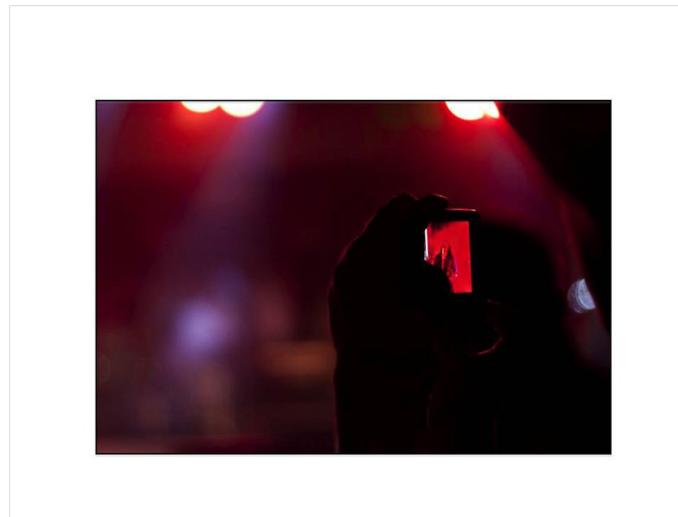
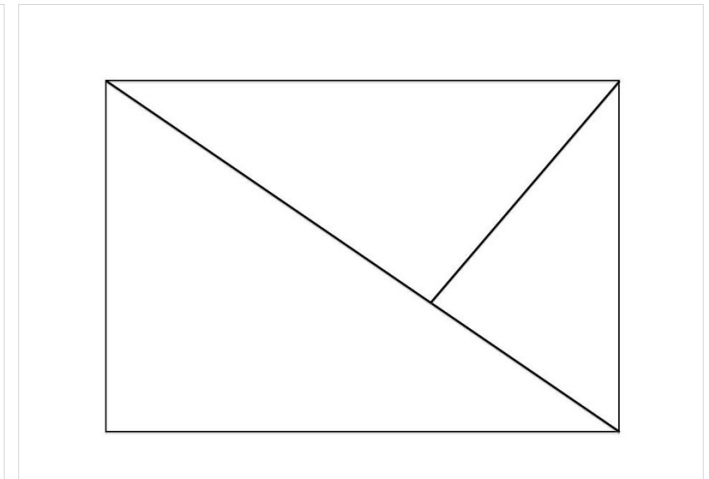
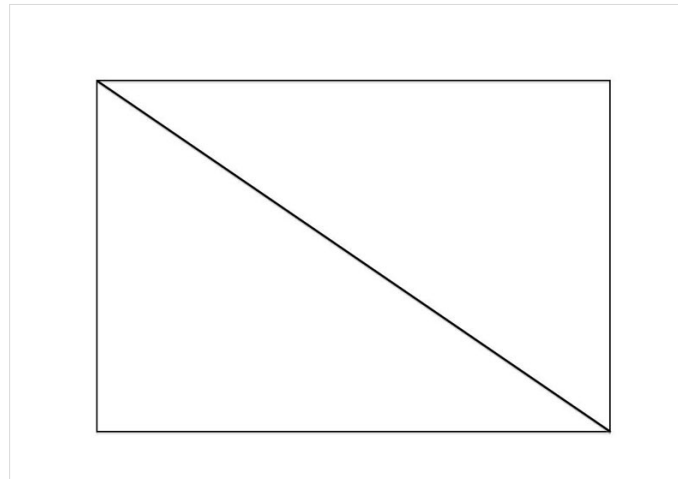
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Dynamic Symmetry:



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Genres of Photography

Photography Genres:

- Sports photography
- Fashion photography
- Photojournalism
- Landscape Photography
- Wildlife Photography
- Macro Photography
- Wedding Photography
- Street Photography
- Product Photography

Sports photography:

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SPORTS PHOTOGRAPHY



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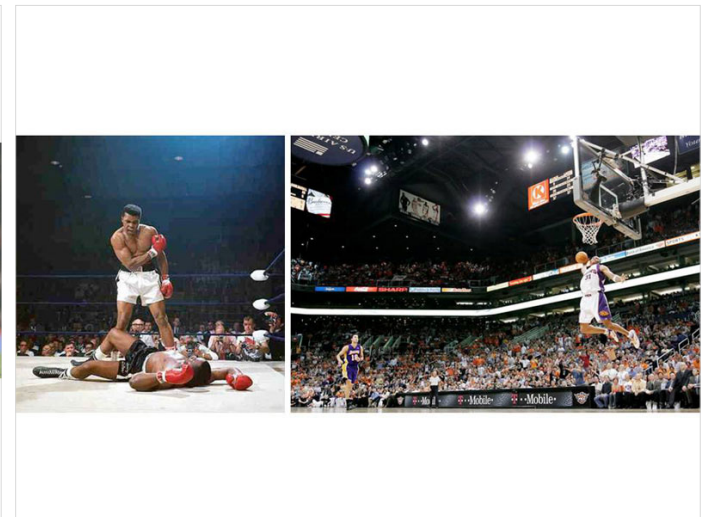
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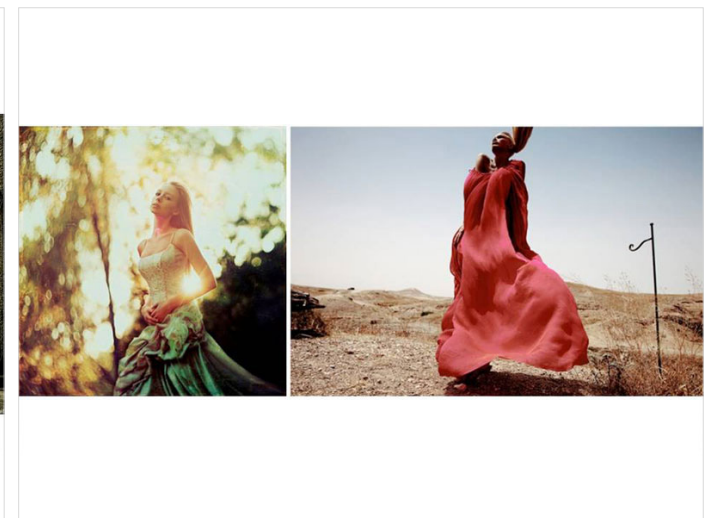
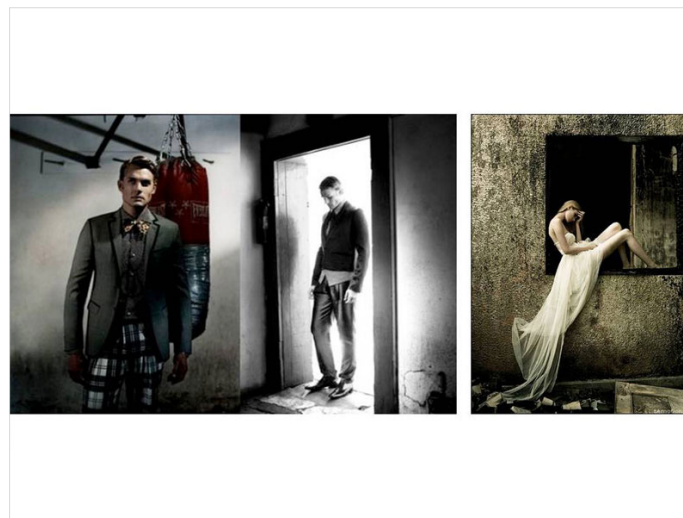
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Fashion photography:



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Photojournalism:

PHOTOJOURNALISM



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Landscape Photography:



LANDSCAPE PHOTOGRAPHY

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Wildlife Photography:

WILDLIFE PHOTOGRAPHY



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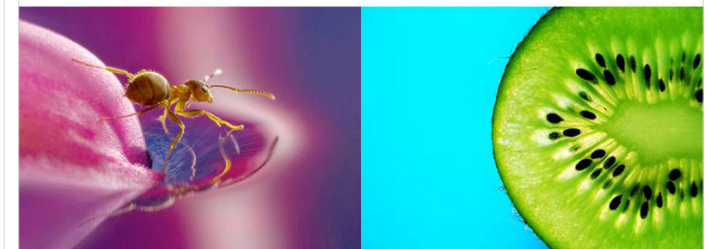
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Macro Photography:

MACRO PHOTOGRAPHY



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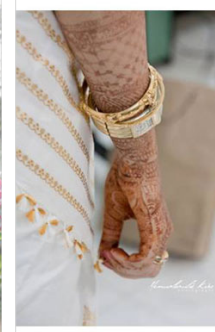
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Wedding Photography:

WEDDING PHOTOGRAPHY



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Street Photography:



STREET PHOTOGRAPHY

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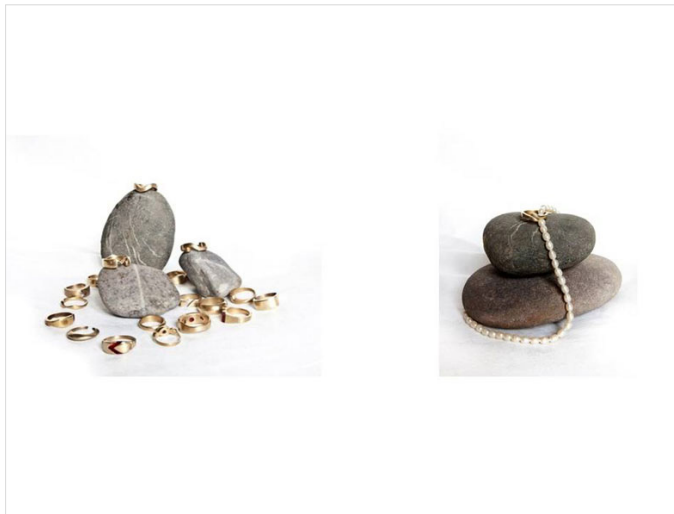
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Product Photography:

PRODUCT PHOTOGRAPHY



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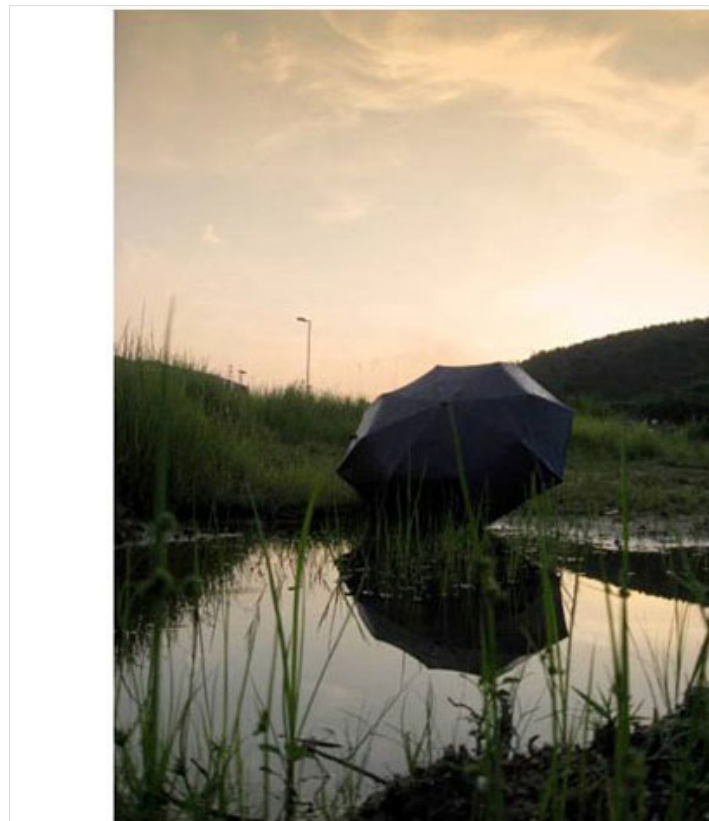
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Photography Examples

Examples of Photography:

- How it Started
- Nature
- Wedding
- Landscape
- Product
- People
- Concerts
- Documentary

How it Started:



MENUOLHOULIE KIRE
PHOTOGRAPHY

HOW IT STARTED

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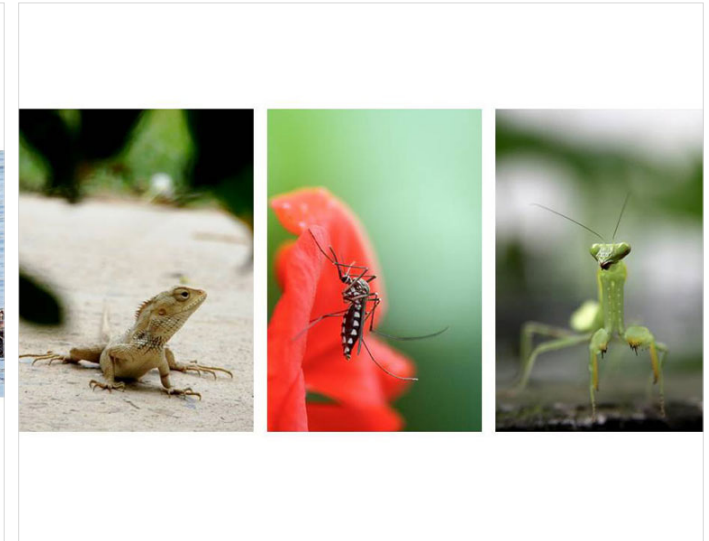
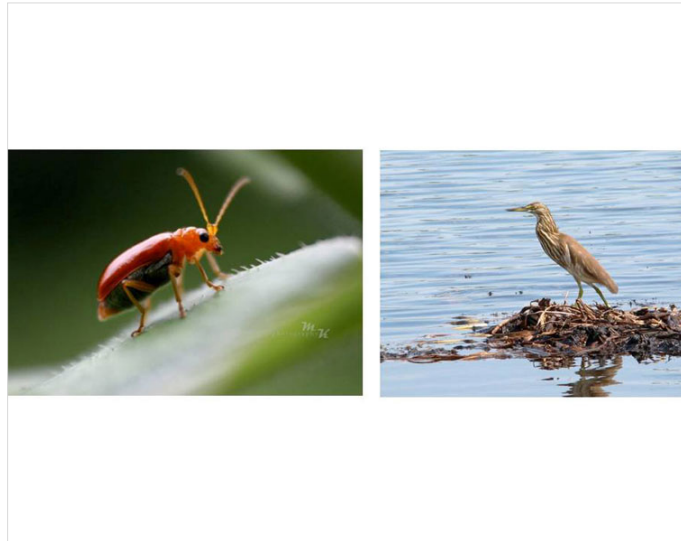
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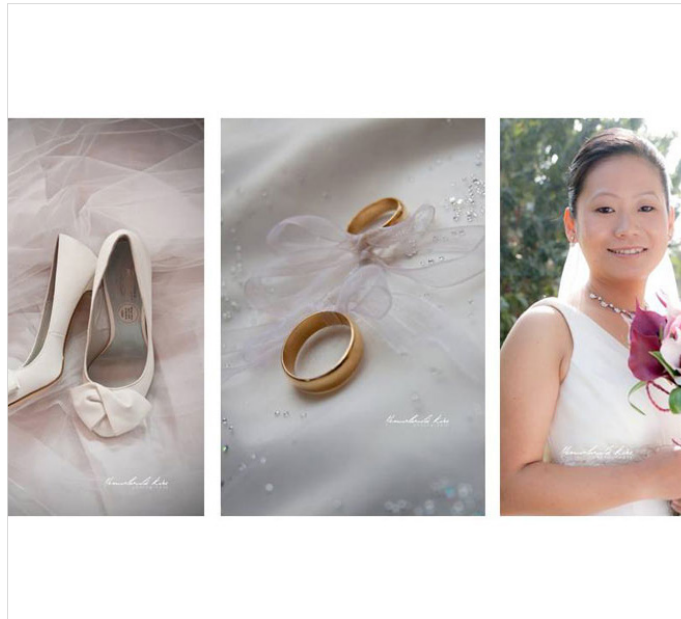
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Nature:



Wedding:



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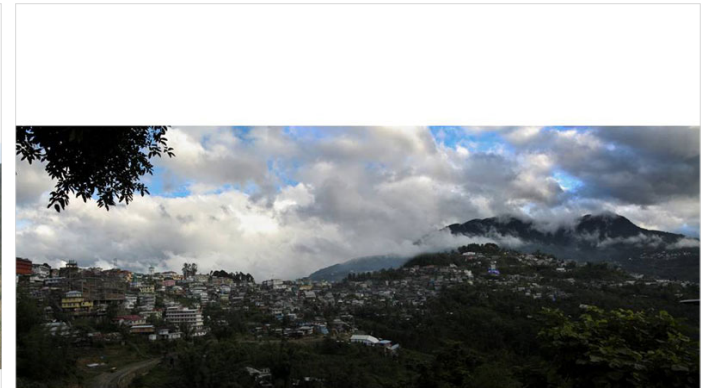
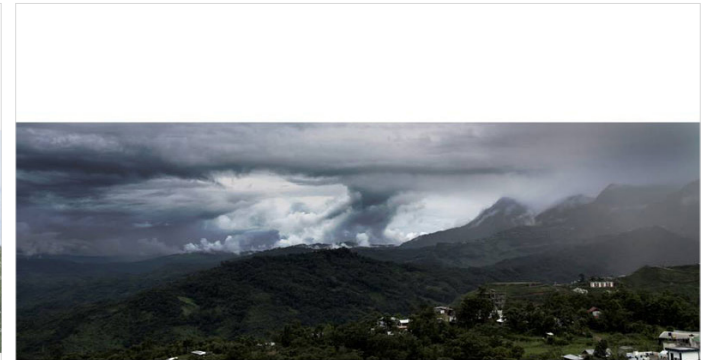
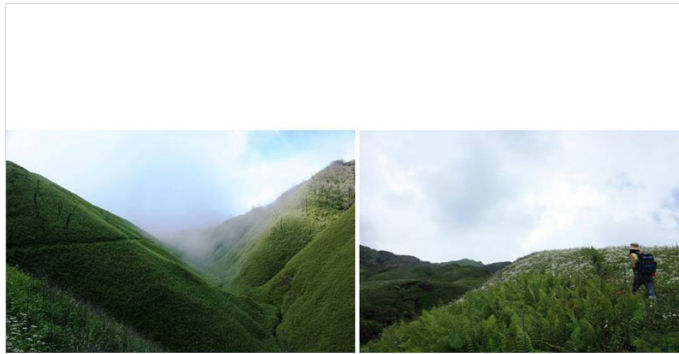
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Landscape:



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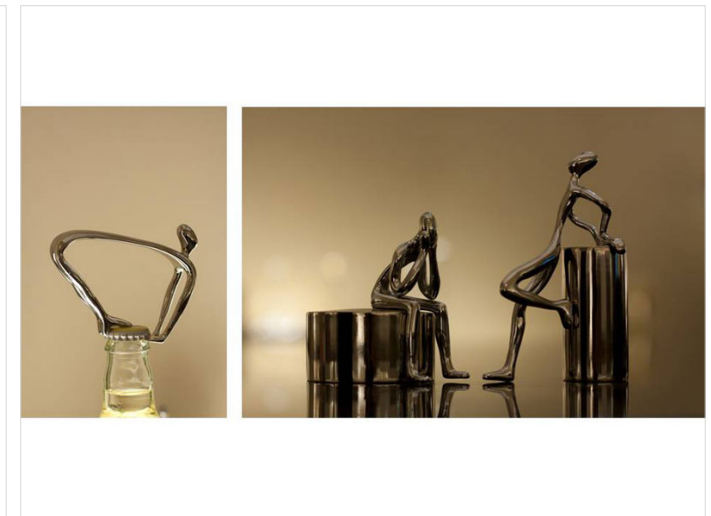
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Source:

<https://dsource.in/course/photography/photography-examples>

Product:



1. Cameras and Lenses
2. Camera Features
3. Modes of camera
4. Metering
5. Visual Principles
6. Genres of Photography
7. Photography Examples
8. Contact Details

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Photography

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by

Menuolhoulie Kire and Prof. Ravi Mokashi

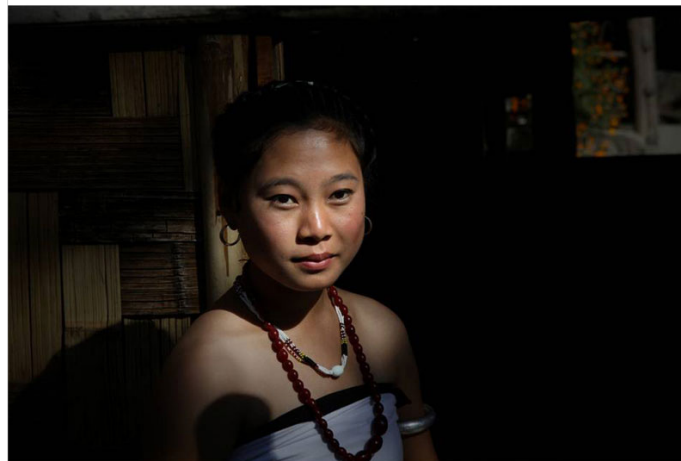
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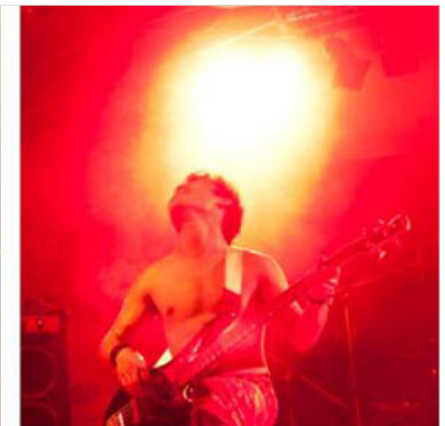
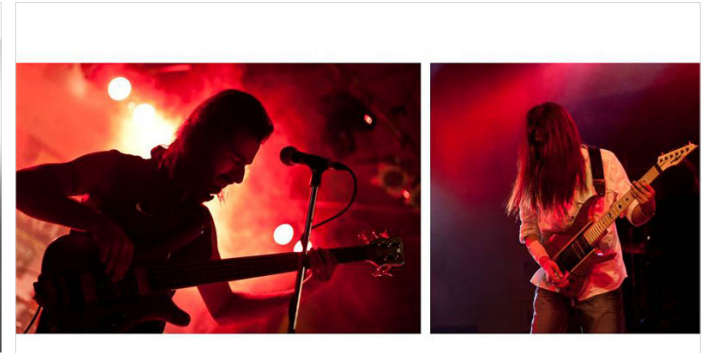
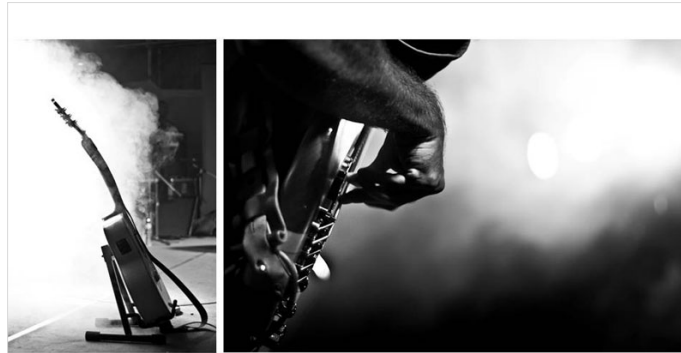
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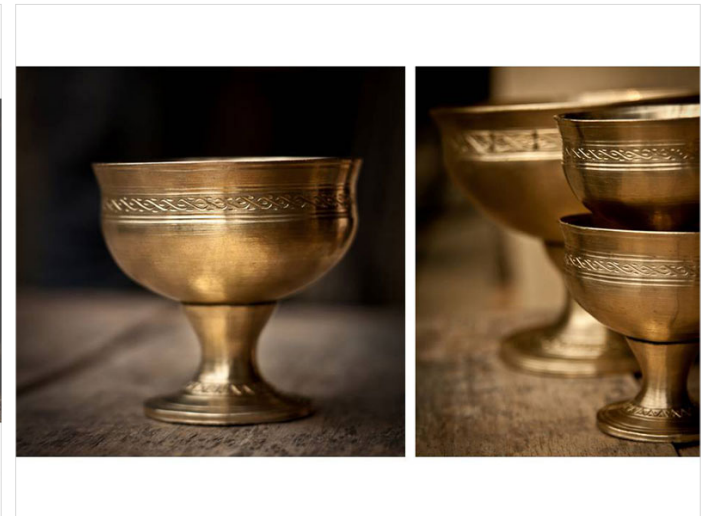
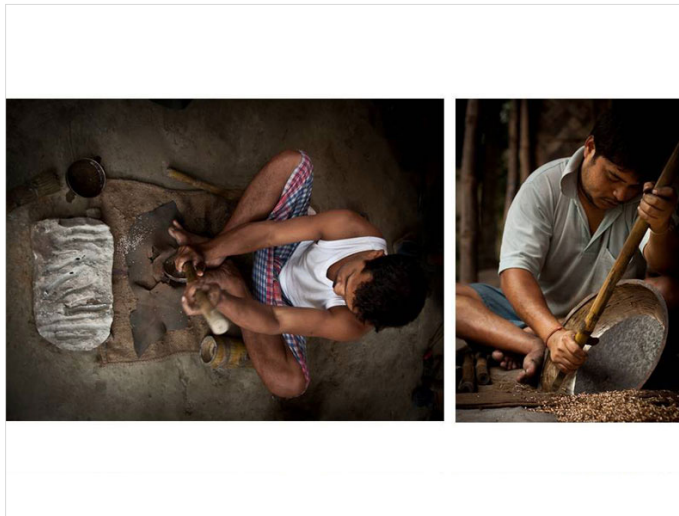
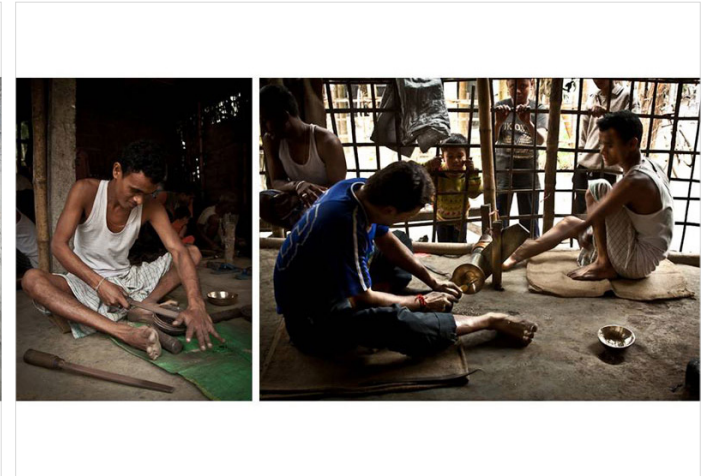
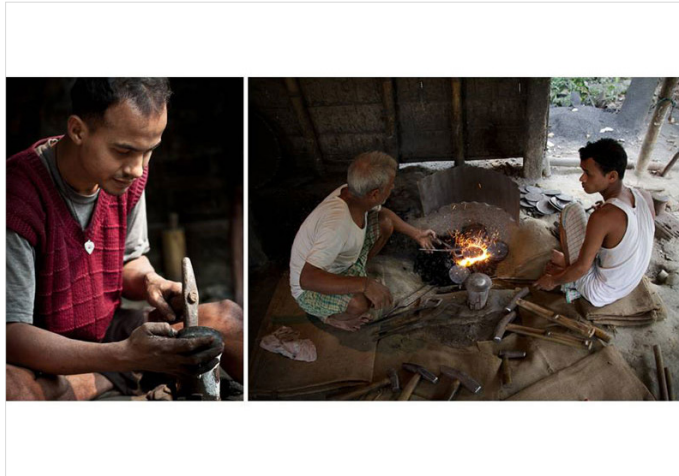
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Source:

<https://dsource.in/course/photography/contact-details>

Contact Details

This documentation for the course was done by Menuolhoulie Kire with Prof. Ravi Mokashi Punekar, faculty at [DoD, IIT Guwahati](#).

You can get in touch with Menuolhoulie Kire at [mkire07\[at\]gmail.com](mailto:mkire07[at]gmail.com)

Prof. Ravi Mokashi Punekar at [mokashi\[at\]iitg.ernet.in](mailto:mokashi[at]iitg.ernet.in)

You can write to the following address regarding suggestions and clarifications:

Helpdesk Details:

Co-ordinator

Project e-kalpa

Department of Design

Indian Institute of Technology Guwahati

North Guwahati

Guwahati 781039

Assam,

India

Phone: +91-361-2582500, +91-361-2582451

Fax: +91-361-2690762

Email: [dsource.in\[at\]gmail.com](mailto:dsource.in[at]gmail.com)

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