Modelação e Visualização Tridimensional em Arquitetura

Visualização em Arquitetura

Câmara fotográfica: Lente, Obturador, ISO (sensor)

Victor Ferreira, Prof. Associado

Visualização em Arquitetura

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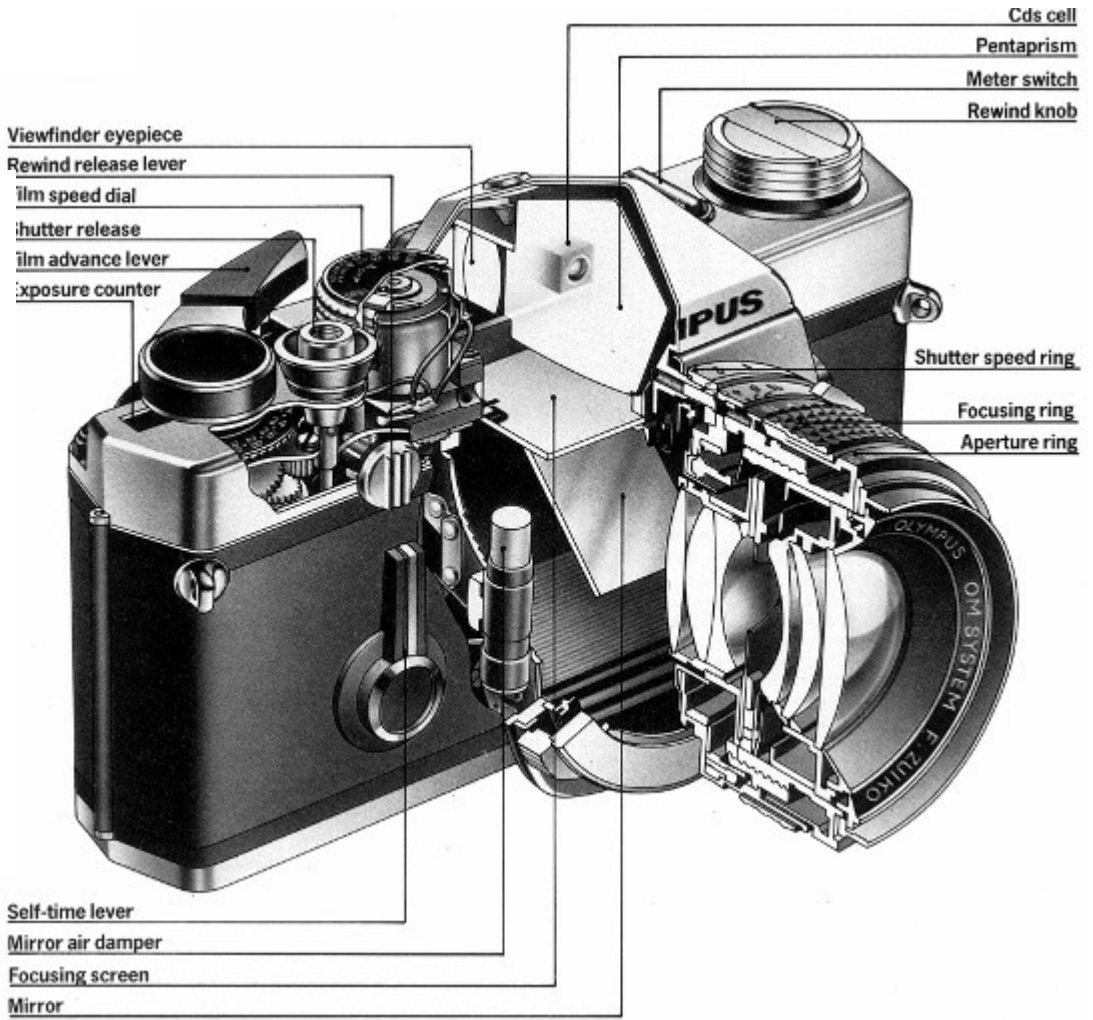
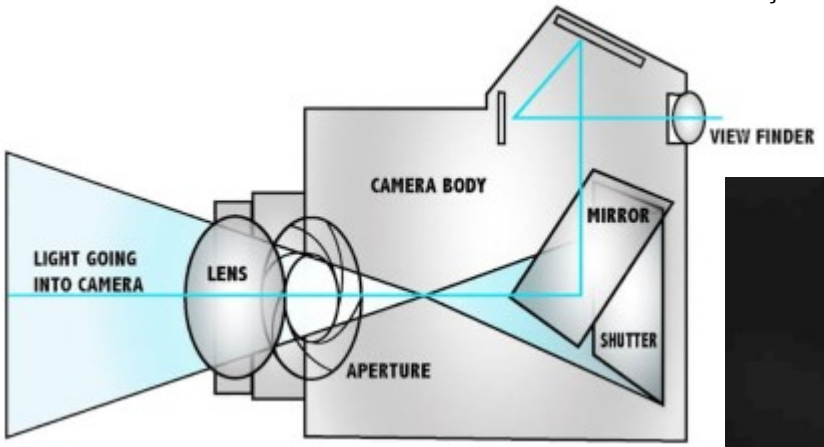
A estrutura de uma câmara fotográfica:

Lente; diafragma; obturador; sensor.

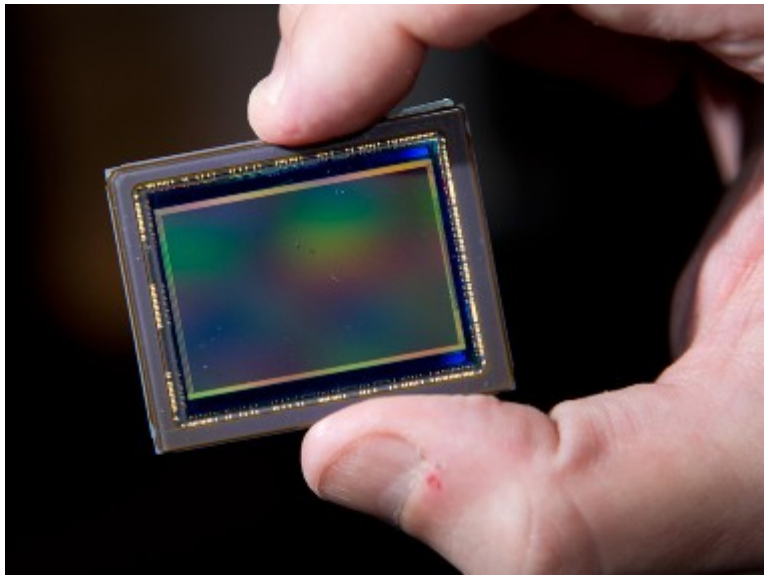

Canon
EOS
550D
CANON ZOOM LENS EF-S 18-135mm 1:3.5-5.6 IS
CANON INC.
ø67mm

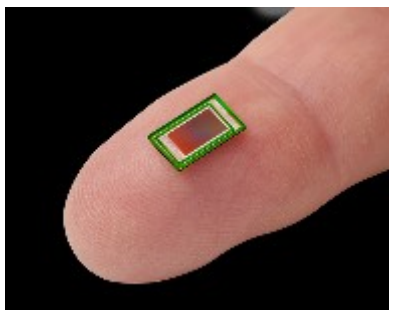

Cds cell
Pentaprism
Meter switch
Rewind knob
Viewfinder eyepiece
Rewind release lever
Film speed dial
Shutter release
Film advance lever
Exposure counter
Shutter speed ring
Focusing ring
Aperture ring
Self-time lever
Mirror air damper
Focusing screen
Mirror
OLYMPUS OM SYSTEM F ZUIKO


VIEW FINDER
CAMERA BODY
MIRROR
LIGHT GOING
INTO CAMERA
LENS
SHUTTER
APERTURE


Aperture Ring
Shutter
Image
Sensor

Sensores digitais de captura de imagem – Image Capture Digital Sensors.





CAMERA SENSOR SIZE COMPARISON CHART

	MEDIUM FORMAT	FULL-FRAME	APS-C	MICRO 4/3	1"	1/2.55"
PICTURE						
SENSOR SIZE	53.0 X 40.20 MM	35.00 X 24.00 MM	23.6 X 15.60 MM	17.00 X 13.00 MM	12.80 X 9.60 MM	6.17 X 4.55 MM
CROP FACTOR	0.64	1	1.52	2	2.7	5.62
CAMERA						

https://capturetheatlas.com/camera-sensor-size/
https://www.unifore.net/analog-surveillance/security-camera-ccd-vs-cmos-image-sensor.html
https://www.inetele.com/post/what-is-a-cmos-sensor

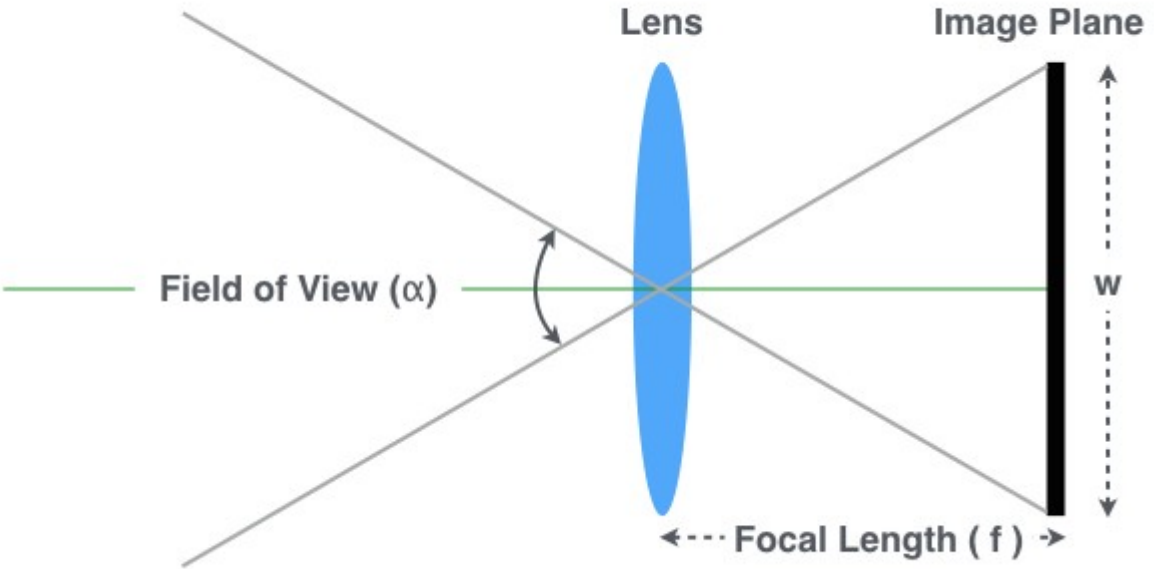
Distância focal:

medida em milímetros da distância entre o ponto principal da lente e o sensor da câmara. Ela desempenha um papel fundamental na composição da imagem, influenciando diretamente o campo de visão e o nível de ampliação.

Focal length:

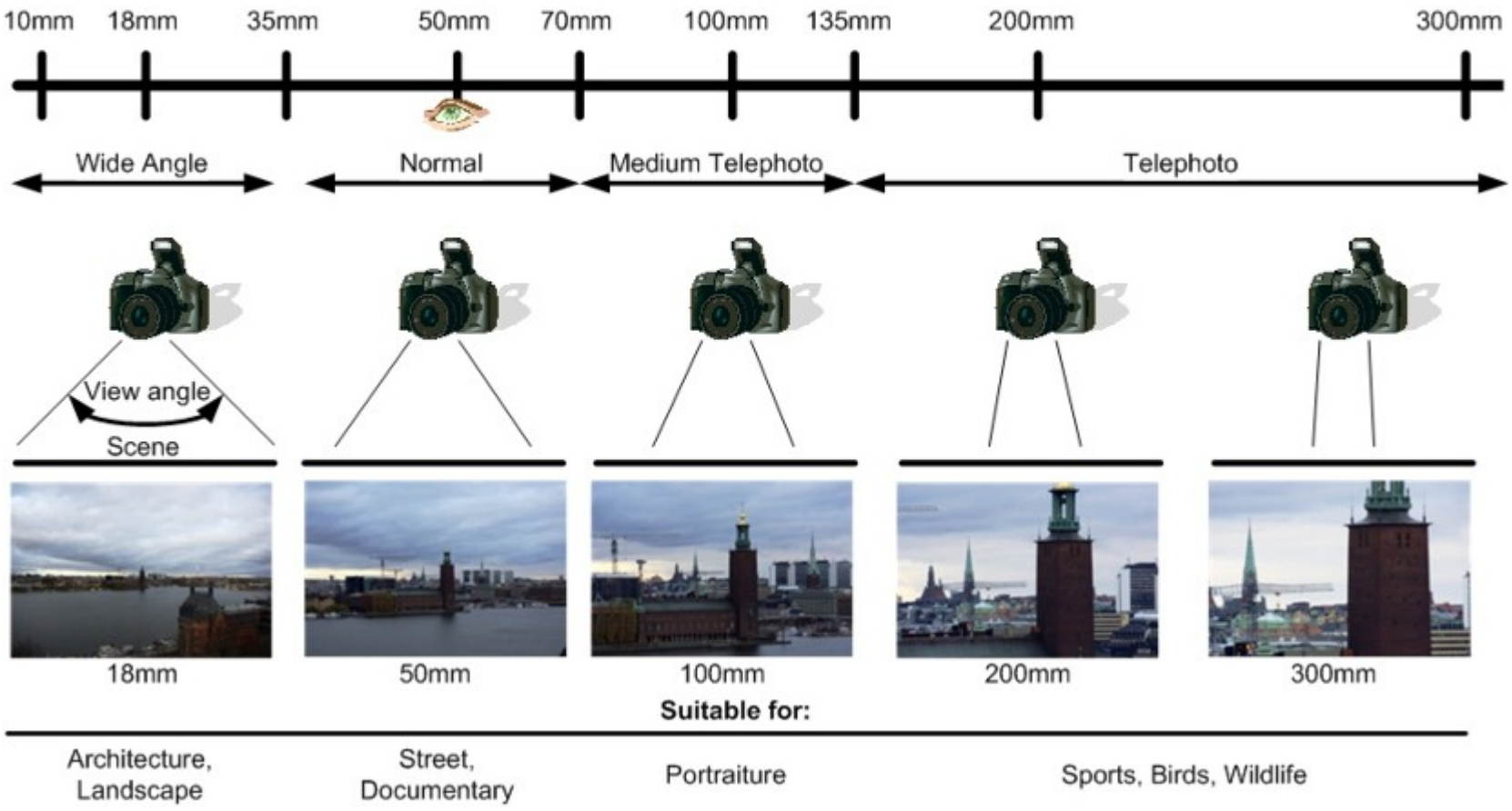
measurement in millimeters of the distance between the main point of the lens and the camera sensor. It plays a crucial role in the composition of the image, directly influencing the field of view and the level of magnification.

Distância Focal - Focal Length

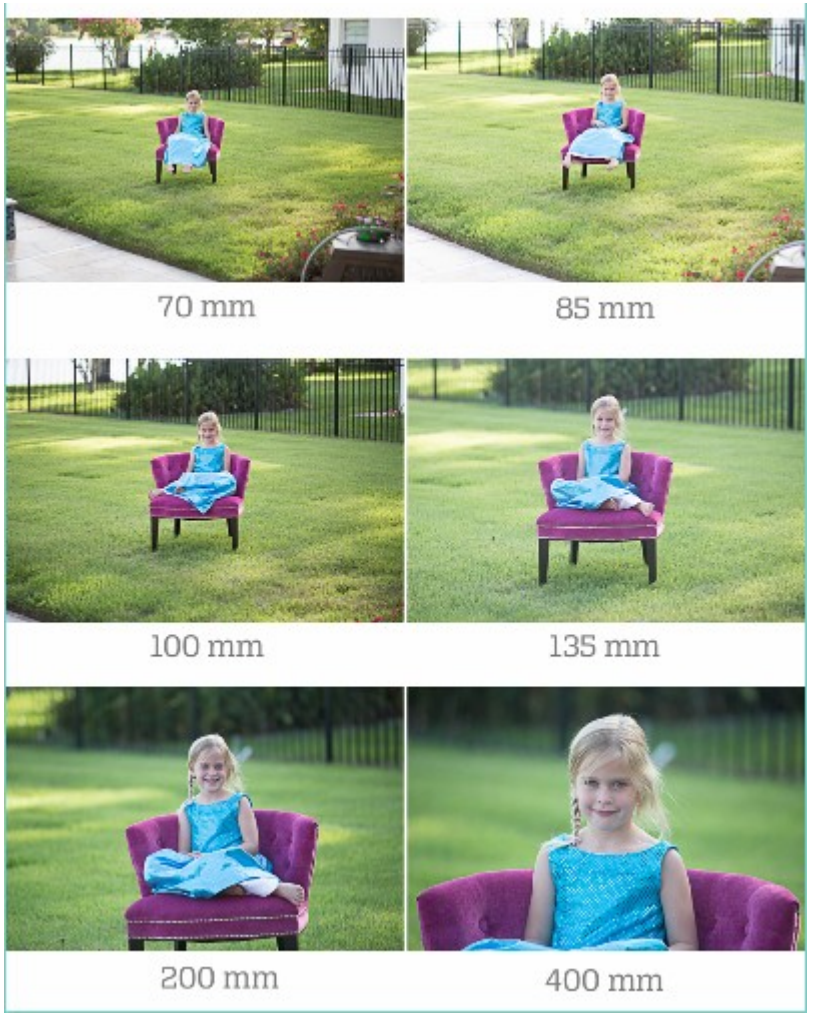


https://learnopencv.com/wp-content/uploads/2016/06/focal-length-fov-sensor-size.jpg

Distância Focal - Focal Length

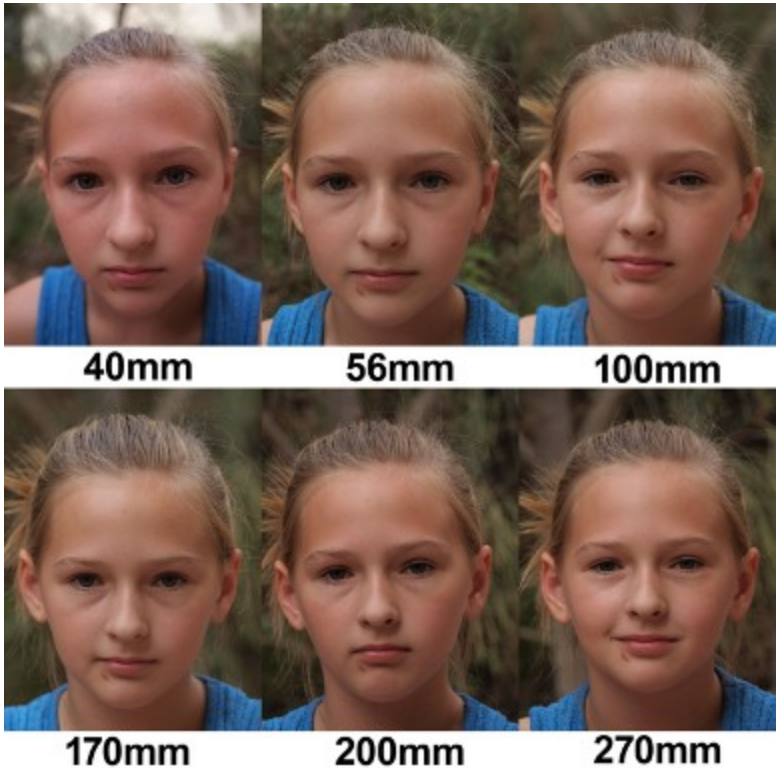


Distância Focal - Focal Length



Distância Focal - Focal Length

Distorção



Campo de visão

16mm

24mm

50mm

200mm

135mm

Profundidade de campo:

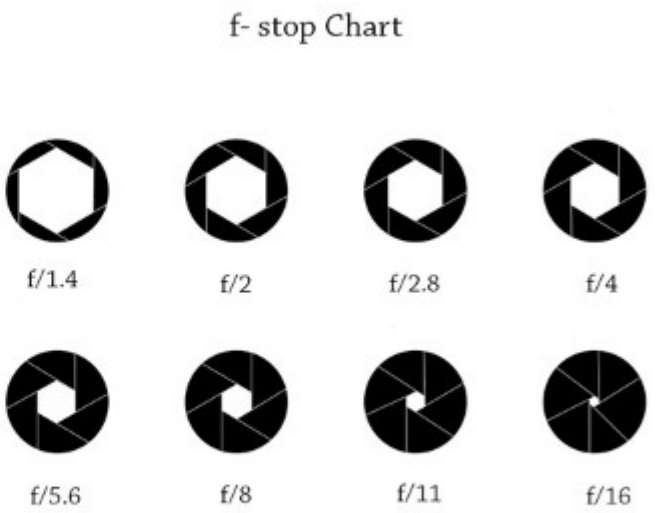
indica a extensão da área nítida na imagem, desde o ponto mais próximo até o mais distante. Ela é determinada pela abertura do diafragma, a distância focal e a distância do objeto, afetando a nitidez dos elementos em primeiro plano e em segundo plano.

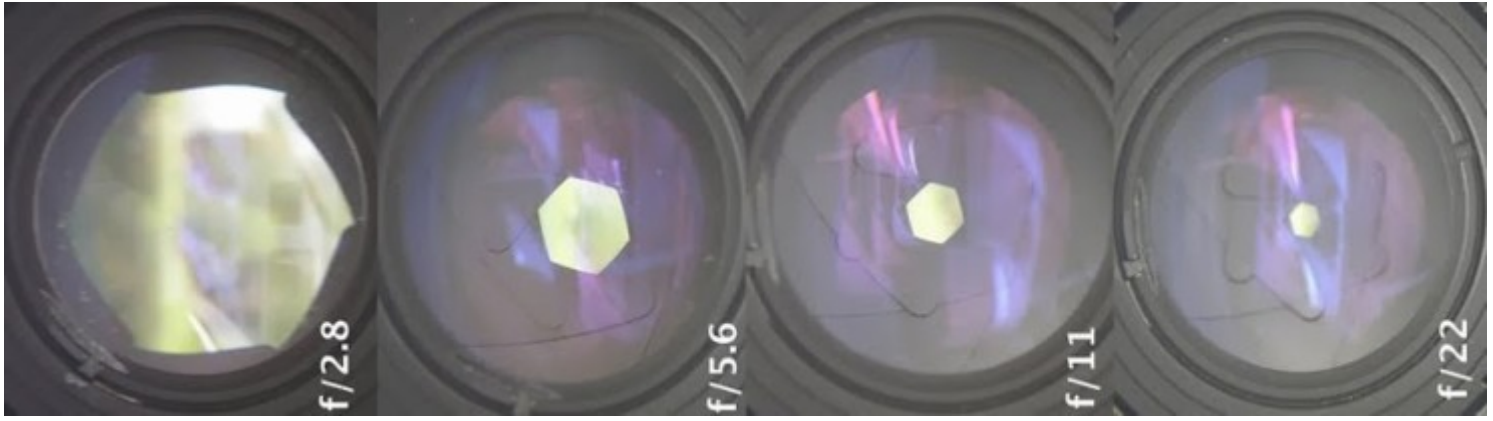
Depth of field:

indicates the extent of the sharp area in the image, from the nearest point to the farthest. It is determined by the aperture of the diaphragm, the focal length, and the distance of the object, affecting the sharpness of elements in the foreground and background.

Diafragma


Aperture diaphragm
metal leaves

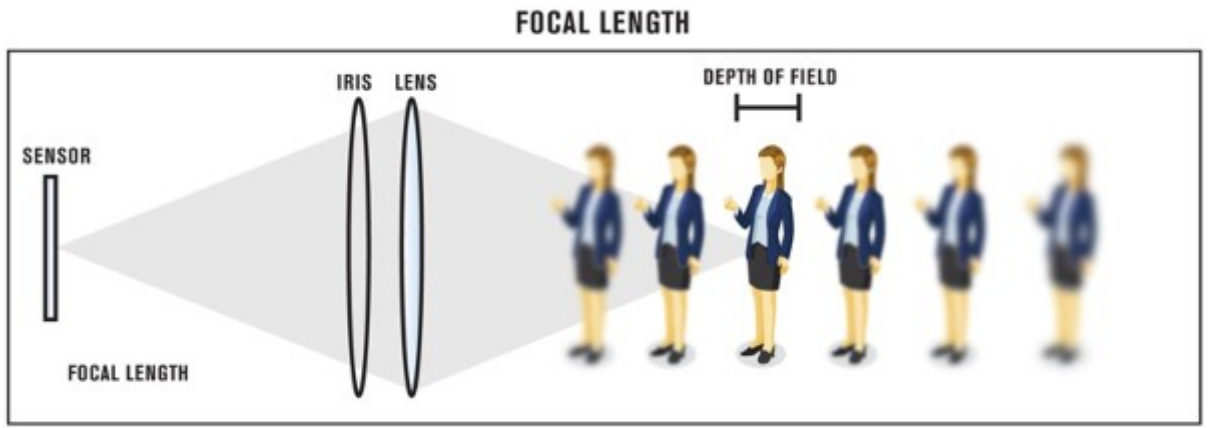

f- stop Chart
f/1.4
f/2
f/2.8
f/4
f/5.6
f/8
f/11
f/16


f/2.8
f/5.6
f/11
f/22

Focagem

Profundidade de campo

Abertura do Diafragma



Abertura do Diafragma:

1. Quantidade de luz

2. Profundidade de campo

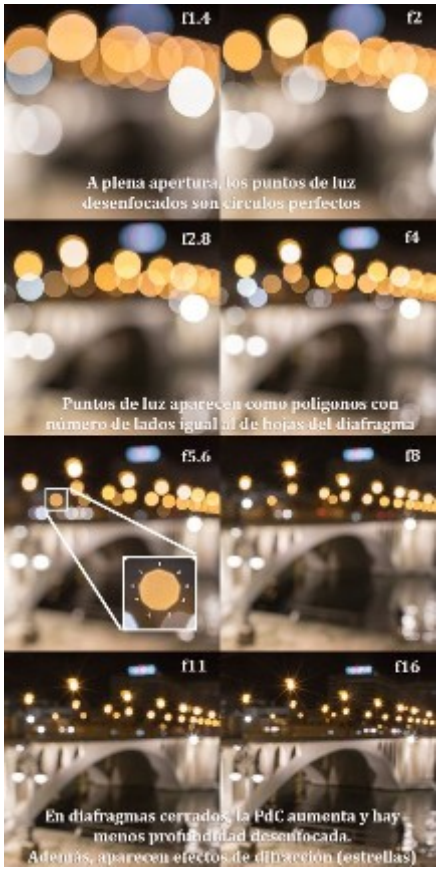

Aperture = f/2.8

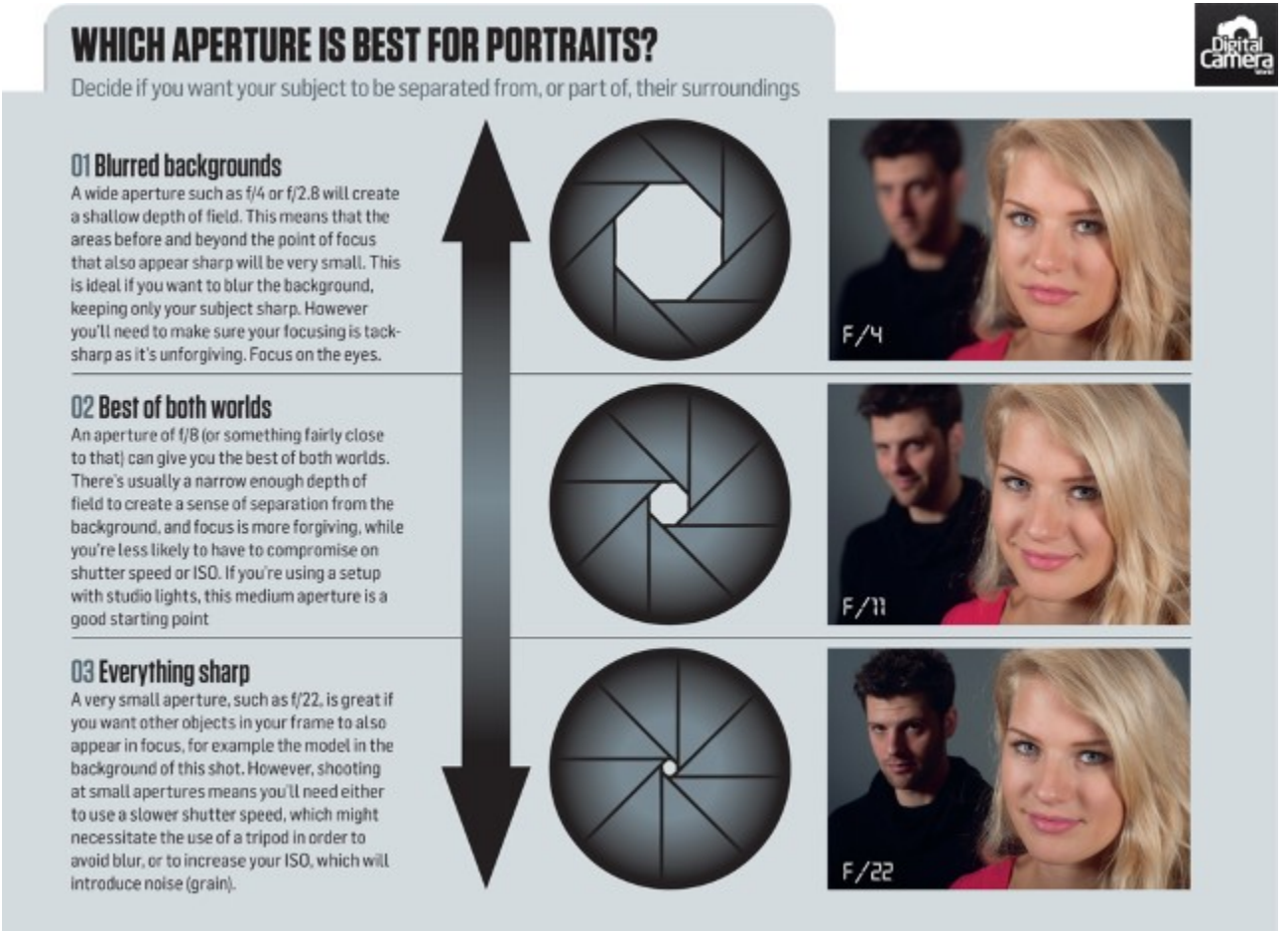

Aperture = f/5.6


Aperture = f/22

3. bookeh

To achieve bokeh in an image, you need to use a fast lens—the faster the better. You'll want to use a lens with at least an f/2.8 aperture, with faster apertures of f/2, f/1.8 or f/1.4 being ideal.




WHICH APERTURE IS BEST FOR PORTRAITS?
Decide if you want your subject to be separated from, or part of, their surroundings
Digital Camera
01 Blurred backgrounds
A wide aperture such as f/4 or f/2.8 will create a shallow depth of field. This means that the areas before and beyond the point of focus that also appear sharp will be very small. This is ideal if you want to blur the background, keeping only your subject sharp. However you'll need to make sure your focusing is tack-sharp as it's unforgiving. Focus on the eyes.
F/4
02 Best of both worlds
An aperture of f/8 (or something fairly close to that) can give you the best of both worlds. There's usually a narrow enough depth of field to create a sense of separation from the background, and focus is more forgiving, while you're less likely to have to compromise on shutter speed or ISO. If you're using a setup with studio lights, this medium aperture is a good starting point
F/11
03 Everything sharp
A very small aperture, such as f/22, is great if you want other objects in your frame to also appear in focus, for example the model in the background of this shot. However, shooting at small apertures means you'll need either to use a slower shutter speed, which might necessitate the use of a tripod in order to avoid blur, or to increase your ISO, which will introduce noise (grain).
F/22

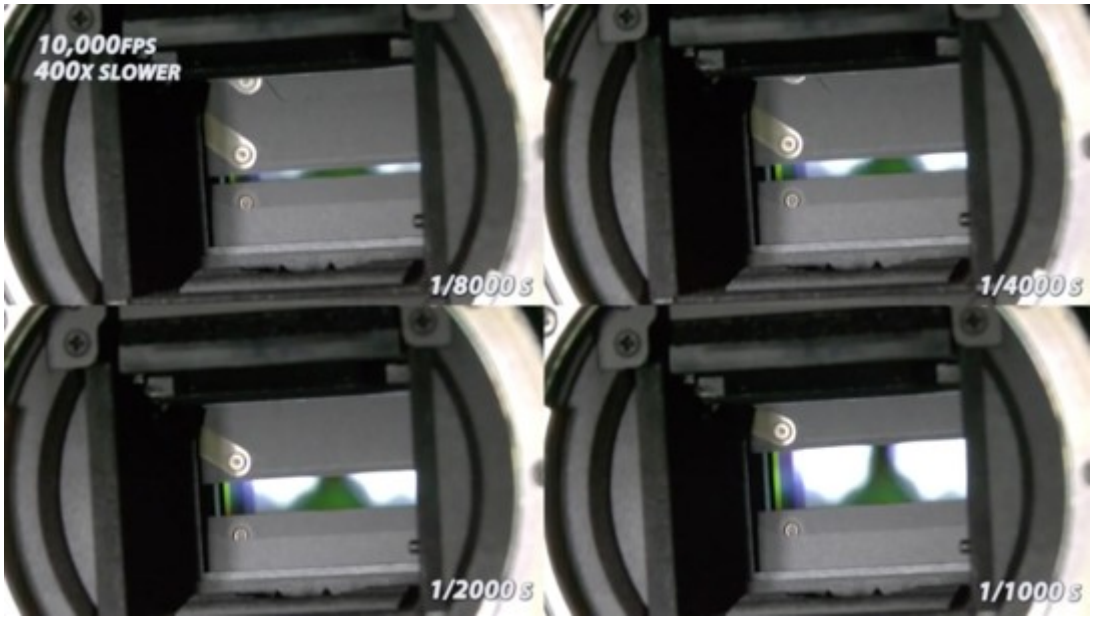
Velocidade do obturador:

tempo durante o qual o obturador da câmera permanece aberto, permitindo que a luz atinja o sensor. Ela desempenha um papel crucial no controle da exposição da imagem e na captura de movimentos, podendo congelar a ação ou criar efeitos de arrasto.

Shutter speed:

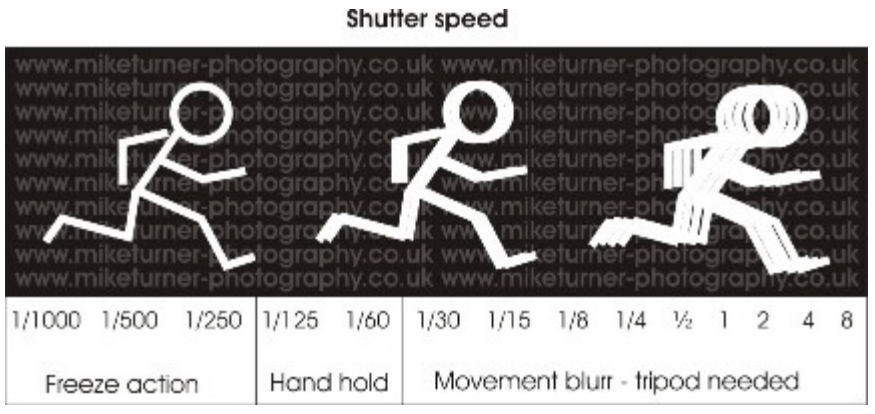
time during which the camera shutter remains open, allowing light to reach the sensor. It plays a crucial role in controlling the exposure of the image and capturing movements, either freezing the action or creating motion blur effects.

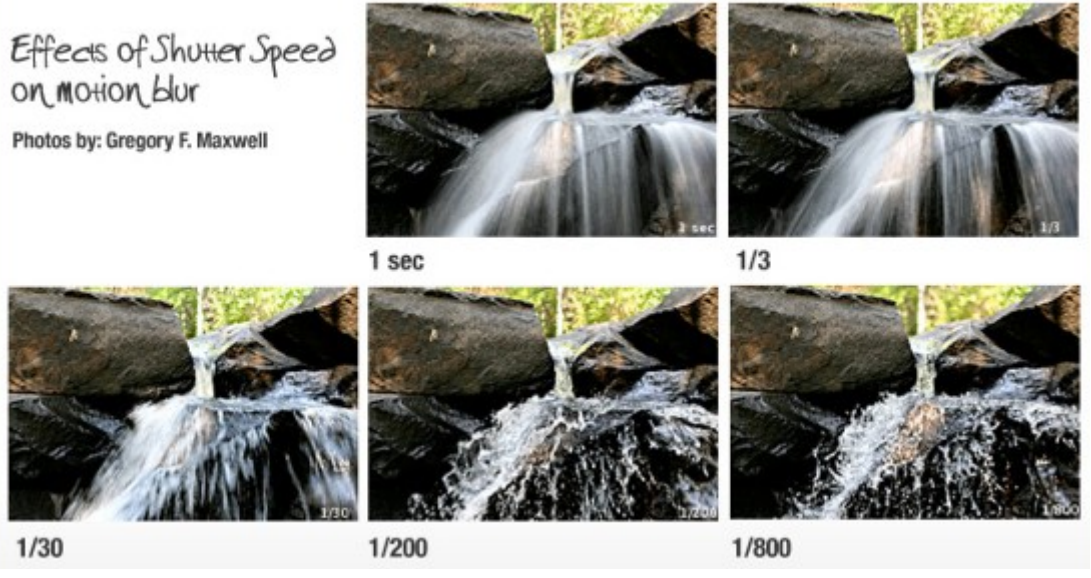
Velocidade do obturador.
Shutter speed.



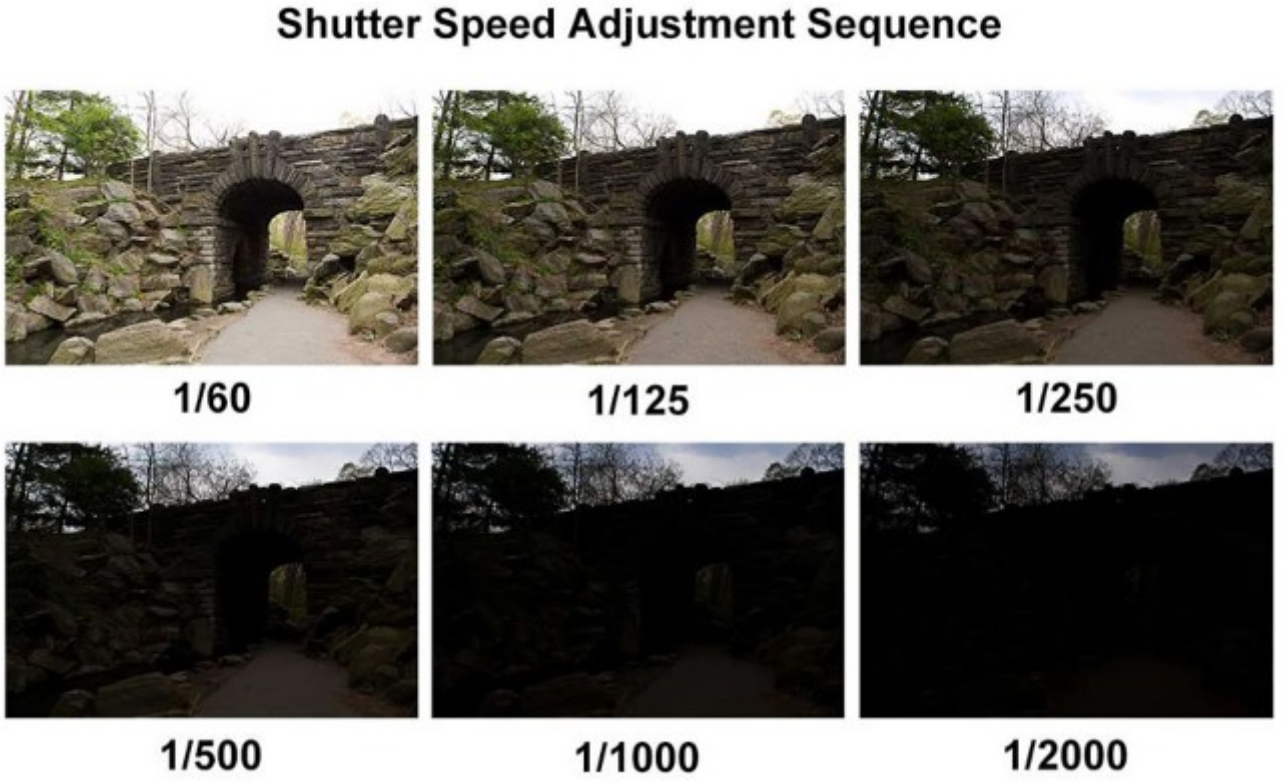
Artigo e vídeo a mostrar o obturador em funcionamento – Video showing the shutter working in slow motion:
https://www.slrlounge.com/see-shutter-mechanism-movement-captured-10000-fps-eye-opening/

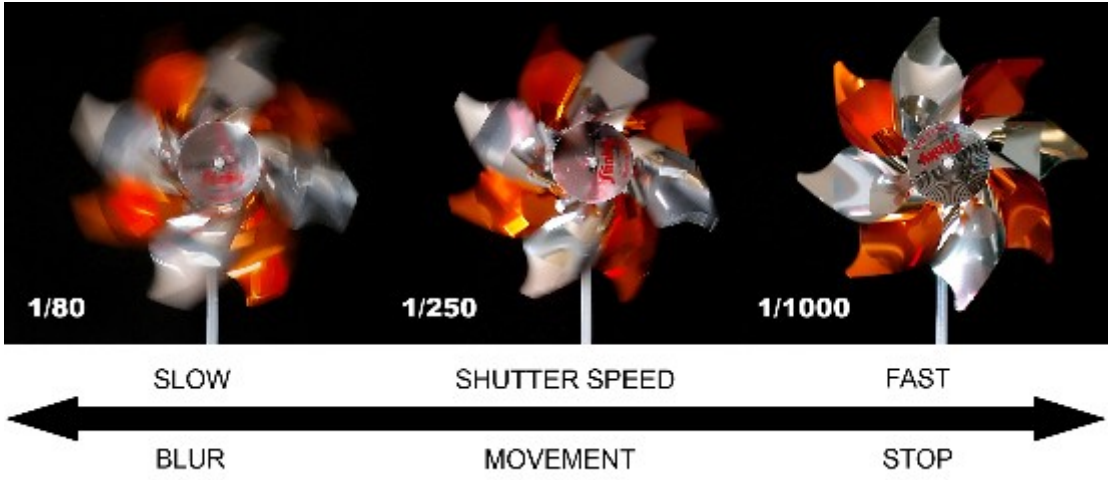
Velocidade do obturador.
Shutter speed.





Velocidade do obturador vs quantidade de luz.
Shutter speed vs amount of light.



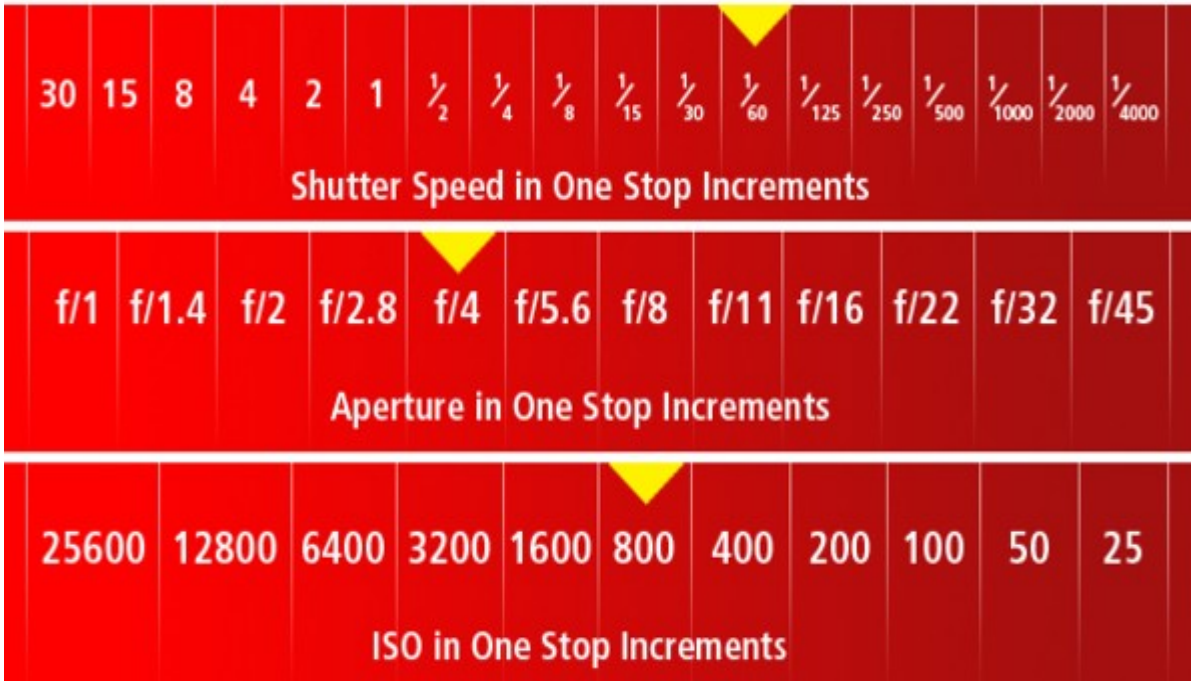


Mostrando o movimento de objetos na imagem com diferentes velocidades do obturador.

Showing the movement of objects in the image trough changes in shutter speed.

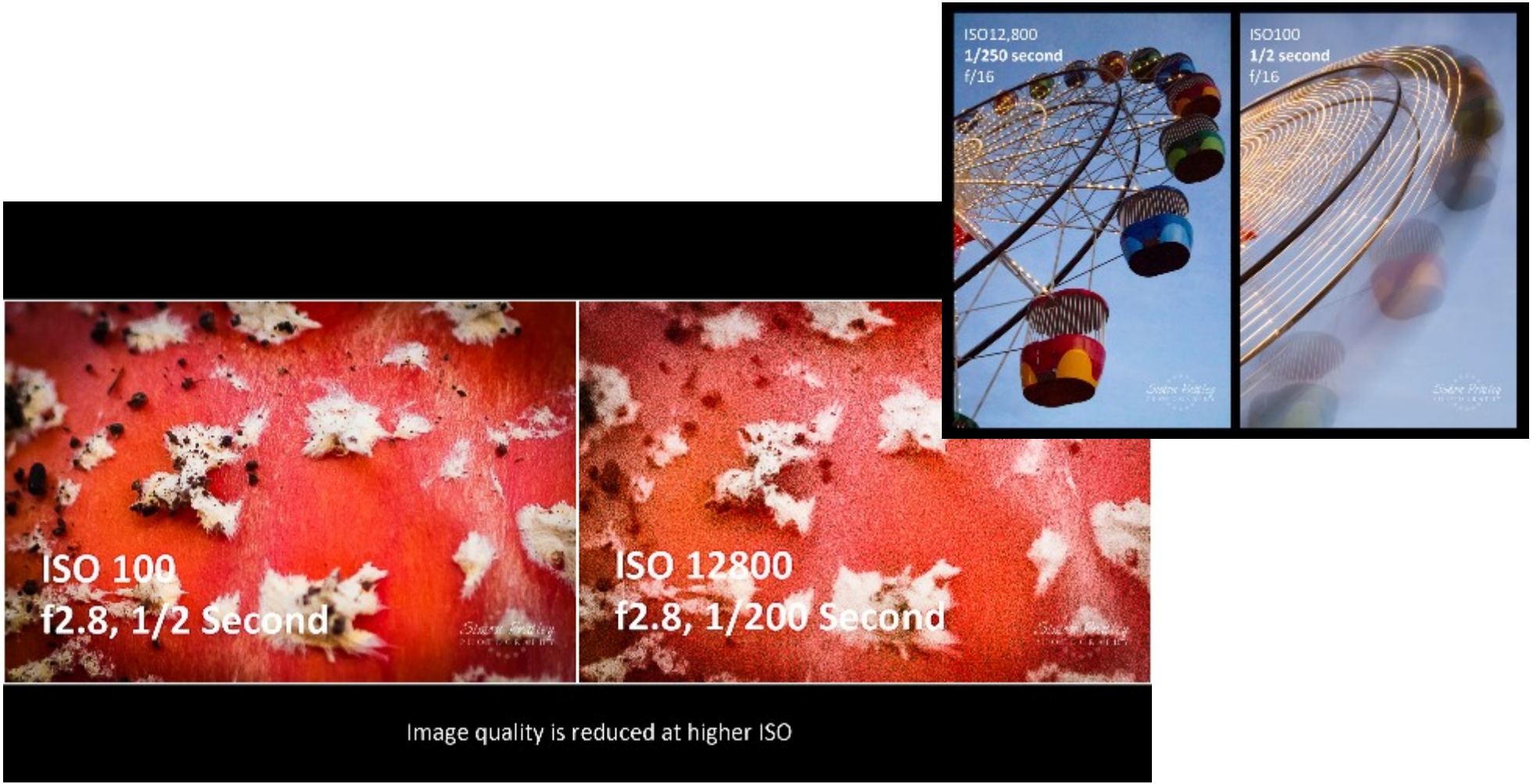
ISO :
medida da sensibilidade do sensor à luz. Aumentar o valor ISO pode ser útil em condições de pouca luz, mas isso pode resultar em um aumento no ruído da imagem. Encontrar o equilíbrio adequado entre esses elementos é essencial para criar imagens visualmente impactantes e bem equilibradas.

ISO:
measure of the sensor's sensitivity to light. Increasing the ISO value can be useful in low-light conditions, but it can result in an increase in image noise. Finding the right balance between these elements is essential to create visually impactful and well-balanced images.



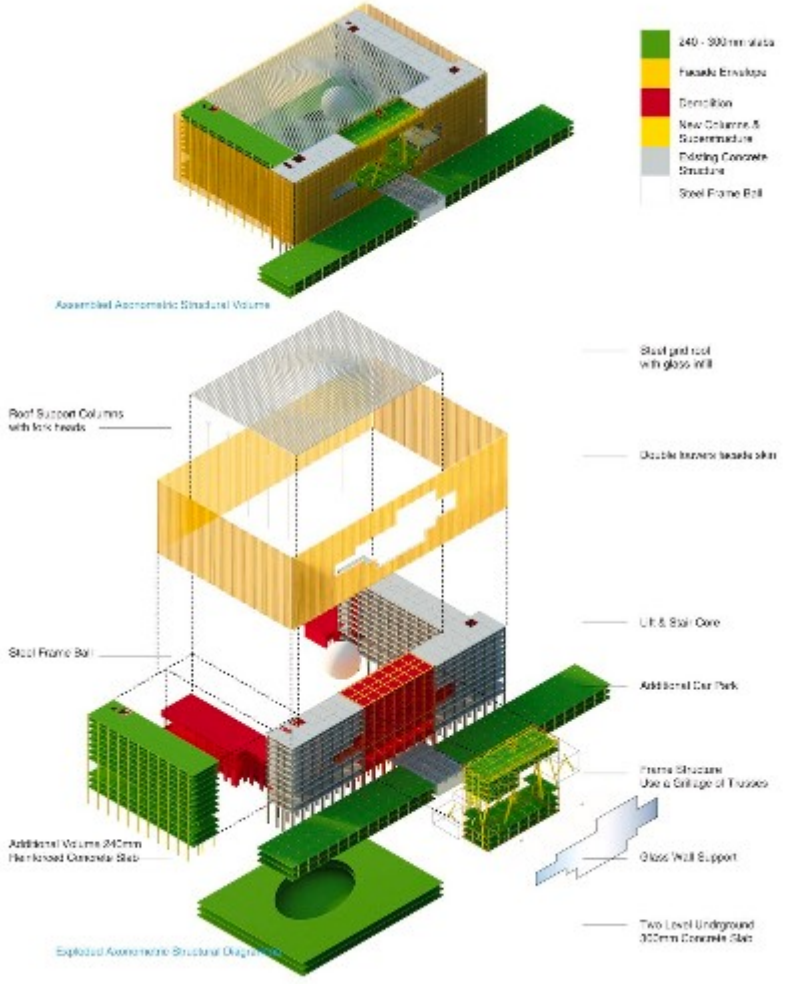
ISO and F/stop		
ISO	F/Stop	Shutter Speed
100	F/5.6	1/60
200	F/8	1/60
400	F/11	1/60
800	F/16	1/60
1600	F/22	1/60
3200	F/32	1/60

ISO and Shutter Speed		
ISO	F/Stop	Shutter Speed
100	F/5.6	1/60
200	F/5.6	1/125
400	F/5.6	1/250
800	F/5.6	1/500
1600	F/5.6	1/1000
3200	F/5.6	1/2000



https://simonpratleyphotography.com/exposure-triangle-part-1-iso/#more-2709
https://simonpratleyphotography.com/wp-content/uploads/2014/11/Shutter-Speed-for-Blog1.jpg

https://nightnurse.ch/en/collection/marketing-collection-curators-choice-2020-1110


Steel grid roof
with glass infill
Roof Support Columns
with fork heads
Steel Frame Bay
Lift & Stair Core
Additional Car Park
Frame Structure
Glass Wall Support