How do I control Exposure?

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How do I control Exposure?

Part 1 – Get it right in the camera

What is correct exposure?

Correct exposure – detail in the highlights and in the shadows

What is correct exposure?

Over exposure – highlights are ‘blown’

What is correct exposure?

Under exposure – shadows are ‘blocked up’

Set the camera to Auto

The easiest way to get the correct exposure is to set your camera to ‘auto’.

Modern cameras are so good that this will be correct at least 9 times out of 10.

With digital cameras you can easily check for correct exposure by looking at the image on the screen

So what do I do if it is wrong?

Try setting the camera to the appropriate scene mode

Set the exposure compensation to over- or under-expose

Change the metering mode

Use AE Lock

Exposure compensation

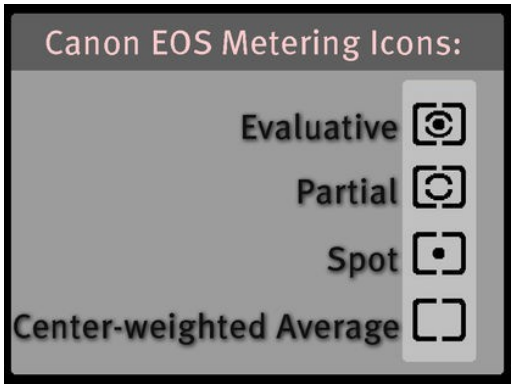
Your camera may have a dial to control this.

Or it may be hidden away in the menu settings

If your image is too dark set the compensation to +
If too light set it to –
+/- ⅔ is usually a good start

Change the metering mode

Probably controlled by pushing a button and turning a dial but check your camera's manual.



Evaluative metering checks the whole scene and tries to determine exposure intelligently.

Partial just measures the central part, where the main subject generally is.

Spot measures a very small area in the centre.

Centre-weighted average measures the whole scene but gives more importance to the centre.

You are trying to measure the most important part of your image.

Use AE Lock

Probably controlled by pushing a button but check your camera's manual.

This is useful if you want to bias the exposure towards an area that is not in the centre of the image.

Point the camera to that area, press the shutter half way and then press the AE lock button. Recompose and shoot the image.

E.g. to make an image brighter, point the camera down towards the ground, to exclude some of the sky, and press the AE button.

Why might the auto-exposure be wrong?

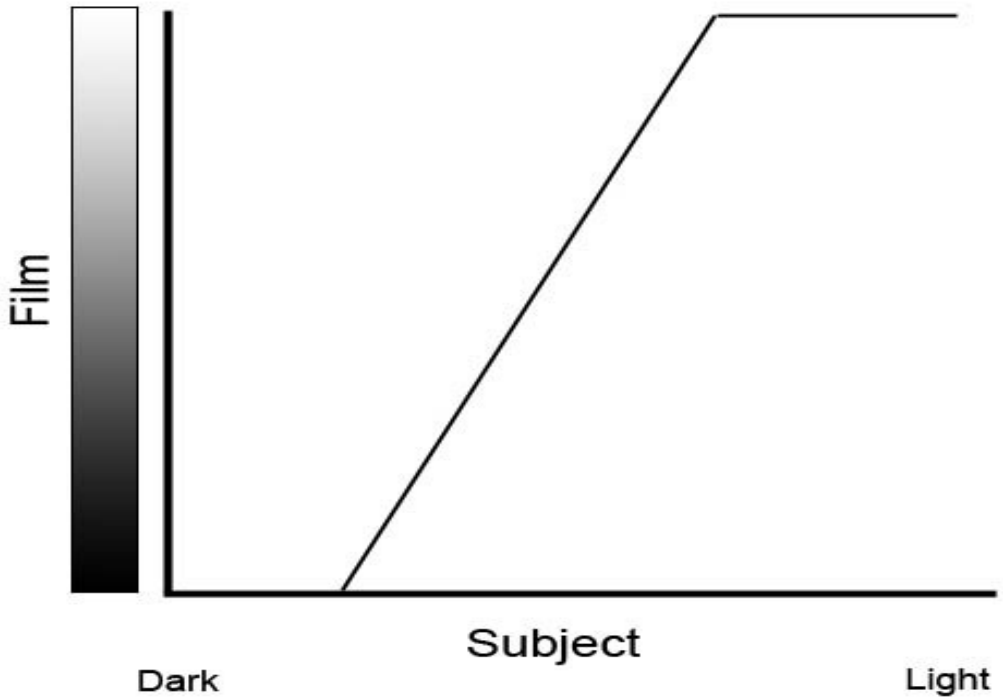
Auto-exposure works by averaging the light over the whole image. It expects this average to be a mid-grey and sets the exposure accordingly.

If the image includes a lot of light sky it will tend to expose so that this comes out mid-grey, i.e. will under-expose.

Similarly, if you take a picture at night, auto-exposure will tend to make the image grey, rather than the dark that you want. You will need to reduce the exposure.

What is exposure?

Getting the right amount of light on the film or sensor.



The Three Components

- Shutter Speed

  The longer the shutter stays open, the more light reaches the sensor

  - Aperture (f-number)

  The larger the aperture, the more light reaches the film.

  - Sensitivity (ISO)

  The greater the sensitivity of the film, the less light is needed to create the image.

Shutter Speed

Measured in fractions of a second.

e.g. 1/250 sec lets in twice as much light as 1/500, four times as much as 1/1000.

Typical range is 30 sec to 1/2000 sec.

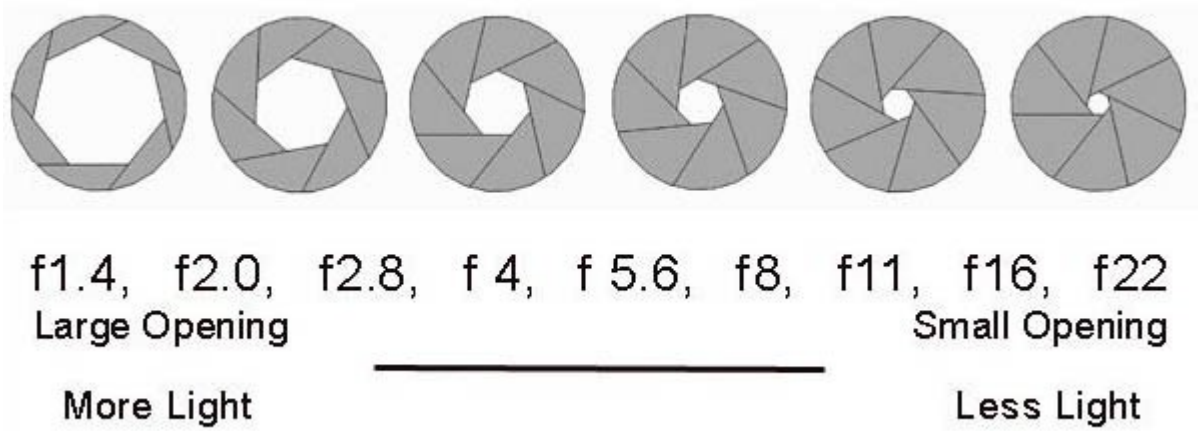
Shown on camera as ‘doubling up’ range:

30”,15”,8”,4”,2”,1”,2,4,8,15,30,60,125,250,500,1000,2000.

Modern cameras also have intermediate values.

Aperture

The size of the hole behind the lens



A ‘doubling up’ range, but:

- Smaller numbers allow in more light
- Numbers must be squared
- f2 allows in four times the light of f4

Sensitivity (ISO)

A higher ISO number needs less light to produce an image.

Usual range is:
100, 200, 400, 800, 1600, 3200, 6400, 12800

Examples

These combinations all produce the same result

Shutter Speed	Aperture	ISO
100	8	200
200	5.6	200
200	8	400
?	8	800
200	?	800

What sort of image will these produce?

100	5.6	200
400	4	100

Why does it matter?

Shutter Speed

- Will a moving subject be blurred?
- Can you hold the camera steady?

Aperture

- Depth of field (how much of the subject is in focus, front to back)

ISO

- Noise, definition, tonal range

Shutter Speed

Moving Subject

1/500 sec	1/40 sec

Shutter Speed

Moving Subject – Camera Panned

1/40 sec	1/40 sec

Shutter Speed

Deliberate blurring

1/320 sec	1/6 sec (Tripod!)

Shutter Speed

Hand Held Camera

1/15 sec Tripod

1/15 sec Hand Held

1/15 sec Stabilized

Aperture

Depth of Field

f 4

f 16

Aperture

Depth of Field – Effect of Focal Length

F = 24mm

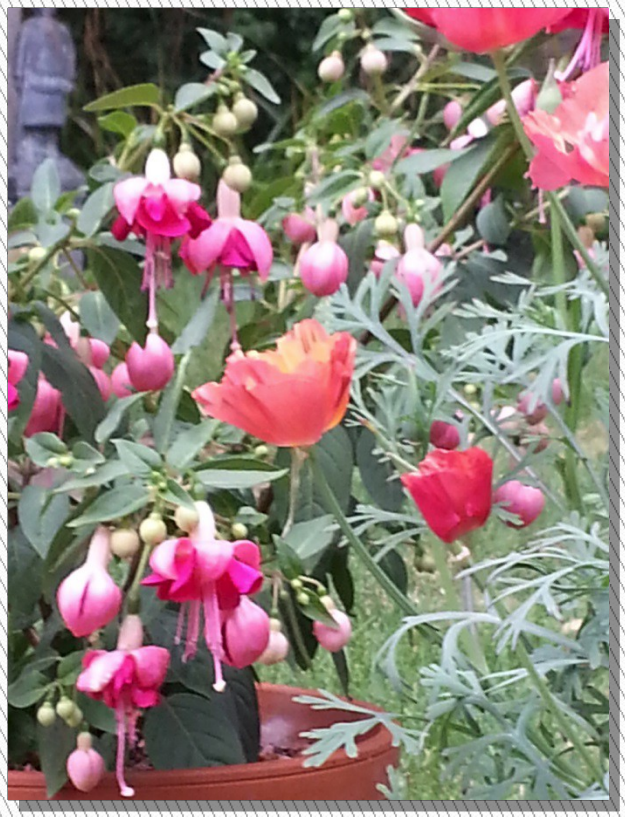
F = 105mm

Aperture

Depth of Field – Effect of Focal Length

SLR
f4 / 105mm

Compact
f4.5 / 30mm



Phone
f2.6 / 3.7mm

ISO

ISO 100

ISO 1600

How do we use these?

This depends on your camera but, in general:

Auto: Leave it all to the camera

P-mode: You set ISO (and flash, motor drive etc.) and camera sets aperture and shutter speed.

Portrait, Landscape, Night, etc.: Like Auto but camera decides on suitable settings for subject type.

How do we use these?

ISO: Usually set first using a dial on the camera. Keep it low to reduce noise

Tv mode: User sets shutter speed, camera sets aperture. E.g. when you definitely want a fast speed for a moving object.

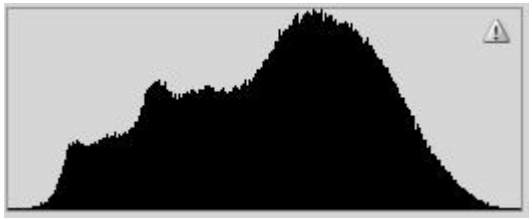
Av mode: User sets aperture, camera sets shutter speed. E.g. to control depth of field.

M mode: User sets both aperture and shutter speed. Camera will still show over/under exposure.

How do we know the exposure is correct?

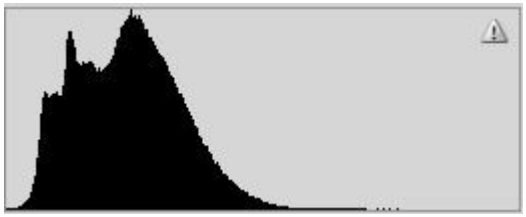
Look at the histogram

Correct exposure



Over exposed

Under exposed



If it’s wrong?

You need to override the camera.

You could go to fully manual mode (M).

Exposure compensation: Tells the camera to over/under expose by a defined amount. Read your camera manual.

If it’s wrong?

The camera will assume the image will average to a mid-grey.

An image with a lot of sky, or of a white building, will therefore come out too dark. You will need to compensate by increasing the exposure (say, 2/3 or 1 stop)

Conversely, with a very dark subject you may need to decrease the exposure.

How do I control Exposure?

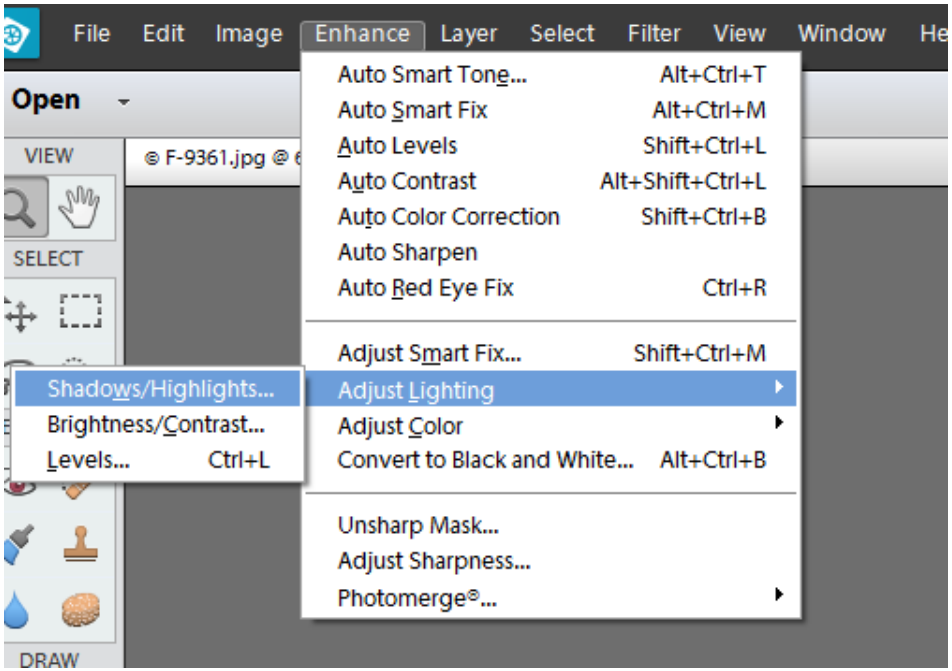
Part 2 – Fix it in Photoshop

Available Tools

Many tools available under the ‘Enhance Menu’

Try the Auto tools first (Smart Tone, Smart Fix and Levels) – you might be lucky.

Then try the Adjust Lighting tools for more control.

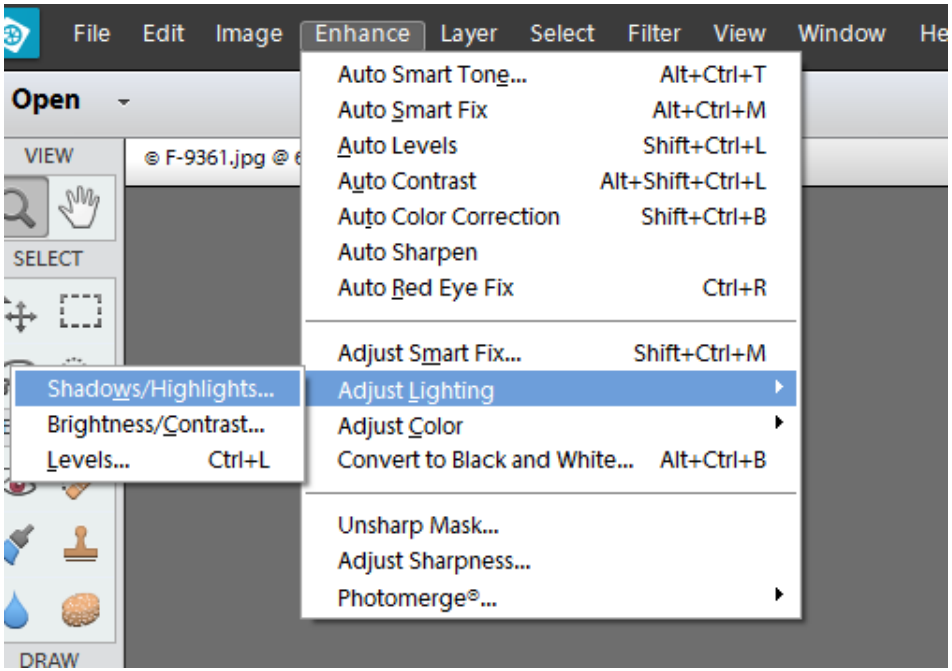


Available Tools

Different tools will work best on different images.

You can try a combination of tools, e.g.

Shadows/Highlights may result in a flat image so try following it with Brightness/Contrast



Problems

or why you should **have** got it right in the camera

All corrections result in degrading the image.

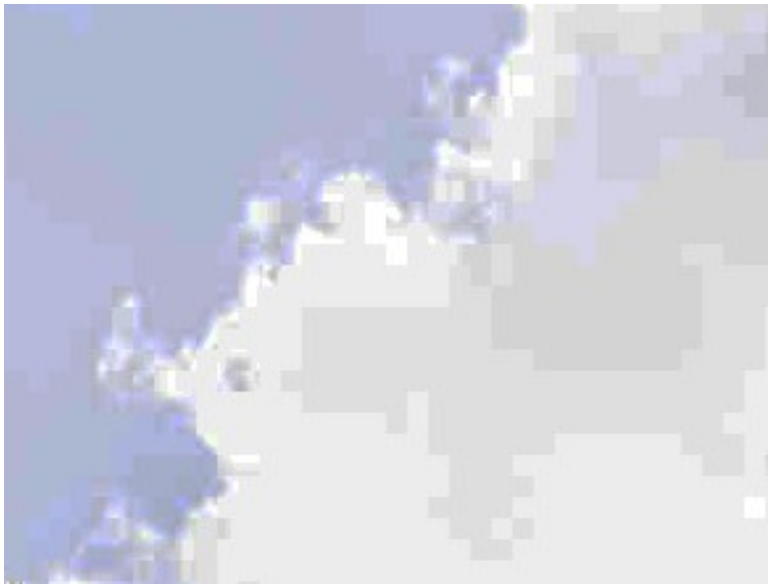
The greater the correction the greater the degradation.

This will be more obvious in larger images and, particularly, in prints.

Problems

300% section of correctly exposed image and of 2 stops under-exposed image after shadows/highlights correction.

Problems



Section of correctly exposed image and of 2 stops over-exposed image after brightness correction.

That’s all folks

Now go away and practice!