

# Lenses



There are two types of lens:

**Prime** – lenses with a fixed focal length

**Zoom** – lenses which have a range of focal lengths

# Prime lenses

**Go to a lower aperture - f/1.8 or even f/1.4**

**This allows faster shots in low light**

**Less glass and complexity gives a sharper clearer photograph**

**But a fixed focal length**

**Most popular is 50mm f/1.8**

# Zoom Lenses

Cover a range of focal lengths and so are more adaptable

Two zoom lenses would cover the whole range for “normal” photography

28-85mm for landscapes and portraits

70-300mm for nature, cars, planes etc.

But slower lenses –  $f/4.0$  –  $f/5.6$  unless spend a large amount of money even then  $f/2.8$  is best

More glass and complexity degrades image compared to prime

# Super Zoom Lenses

Poorer image quality and slow unless you spend a large amount of money but you only need one lens

Turn your DSLR into a bridge camera with a 16mm – 300mm f/3.5 – f/6.0 lens from Tamron

# Macro Lenses

These are prime lenses

Photographing small objects

Focal length is key

A short focal length say 40mm means a very close focus – 35mm – creates shadows and difficult to use

A long focal length say 150mm allows photographing at 15cm or so much easier.

90-105mm Macro lenses are best compromise

# Apertures

Lens apertures range from f/1.0 (rare and very expensive)

To f/32 too small for use by most photographers

Typical mid range lens is f/4.0 to f/16

f/6.3 or less gives a shallow depth of field for images with a specific subject to be highlighted

f/8.0 or more gives a much greater depth of field for images such as landscapes with everything sharp

But your lens is key to your depth of field.....

# Depth of field

## THREE WAYS TO AFFECT DEPTH OF FIELD

How aperture, focus distance and focal length change what will appear sharp

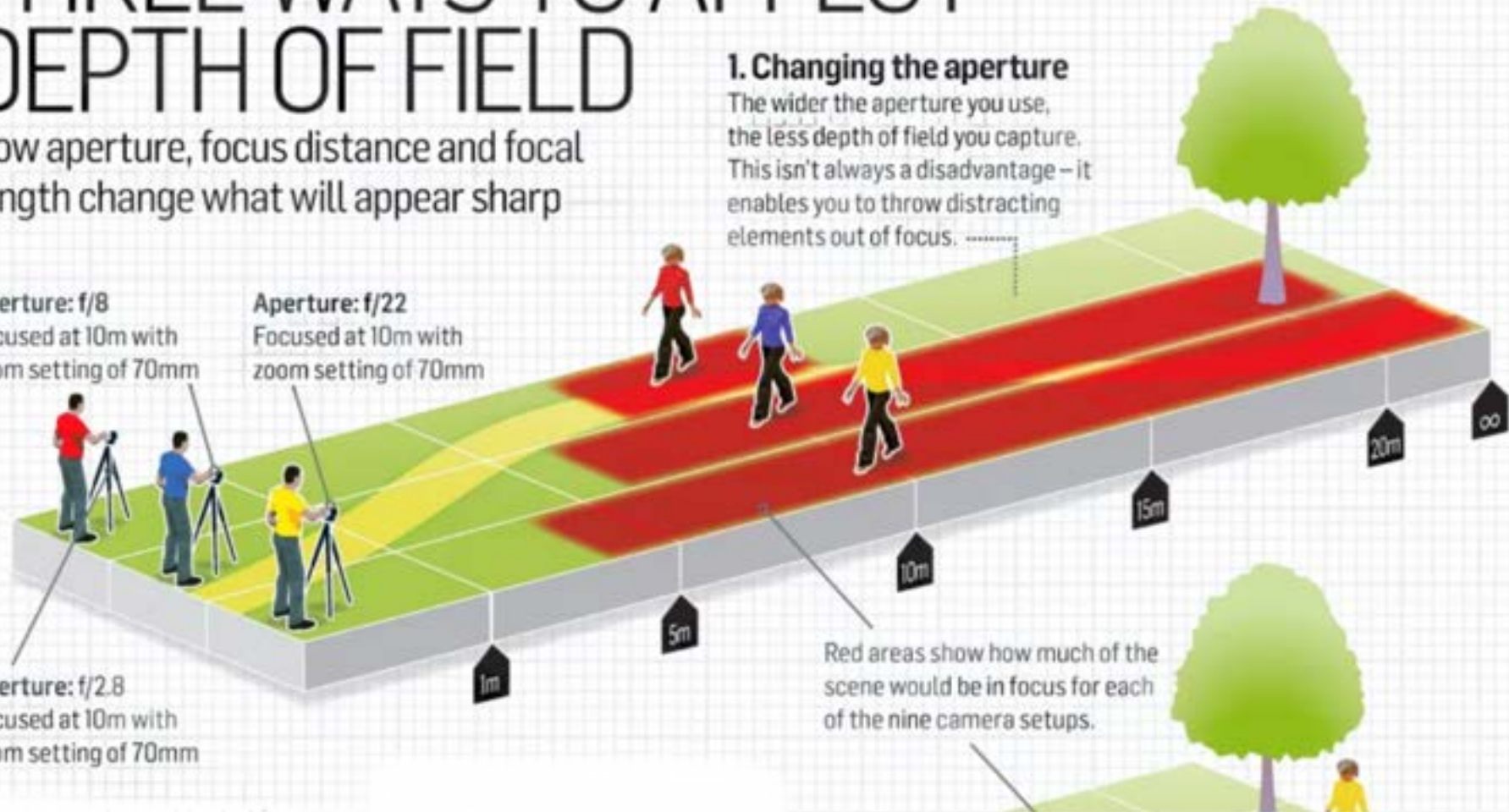
### 1. Changing the aperture

The wider the aperture you use, the less depth of field you capture. This isn't always a disadvantage – it enables you to throw distracting elements out of focus.

Aperture: f/8  
Focused at 10m with zoom setting of 70mm

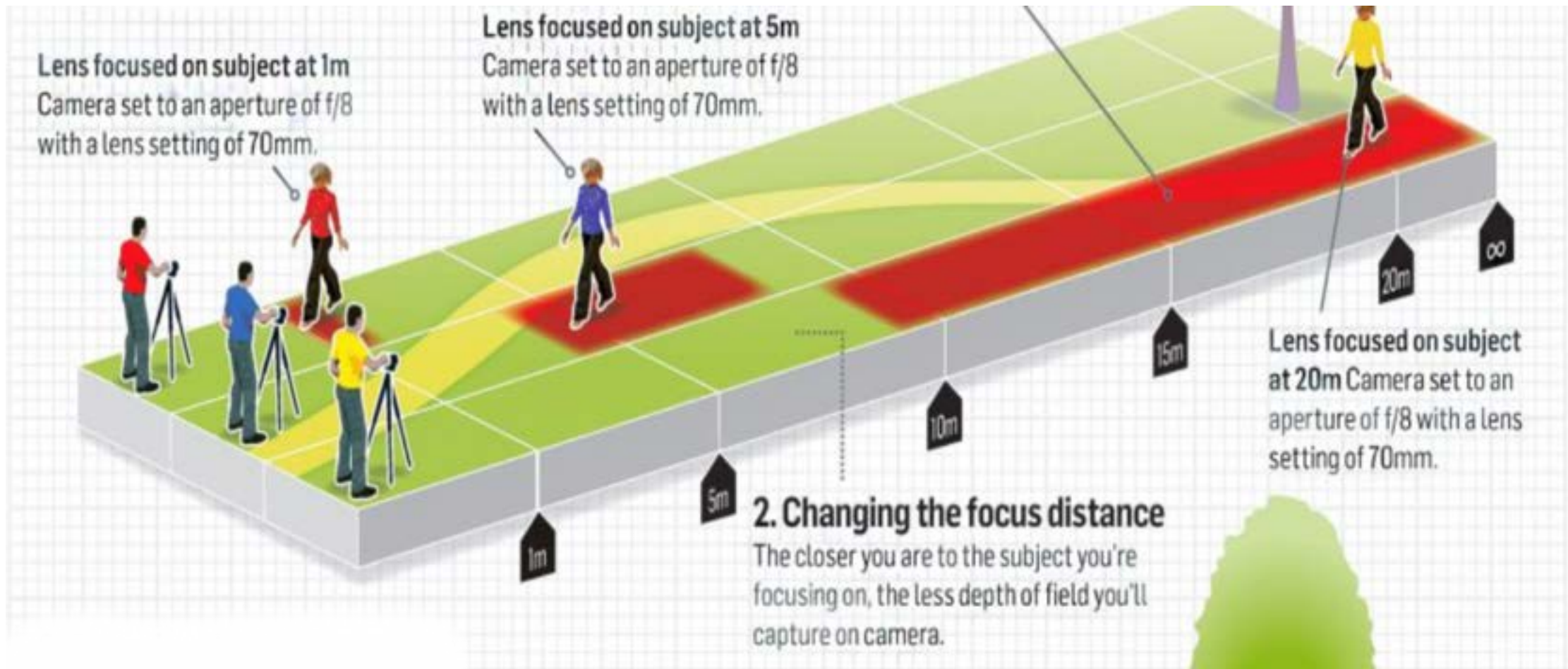
Aperture: f/22  
Focused at 10m with zoom setting of 70mm

Aperture: f/2.8  
Focused at 10m with zoom setting of 70mm





# Depth of field





# Depth of field

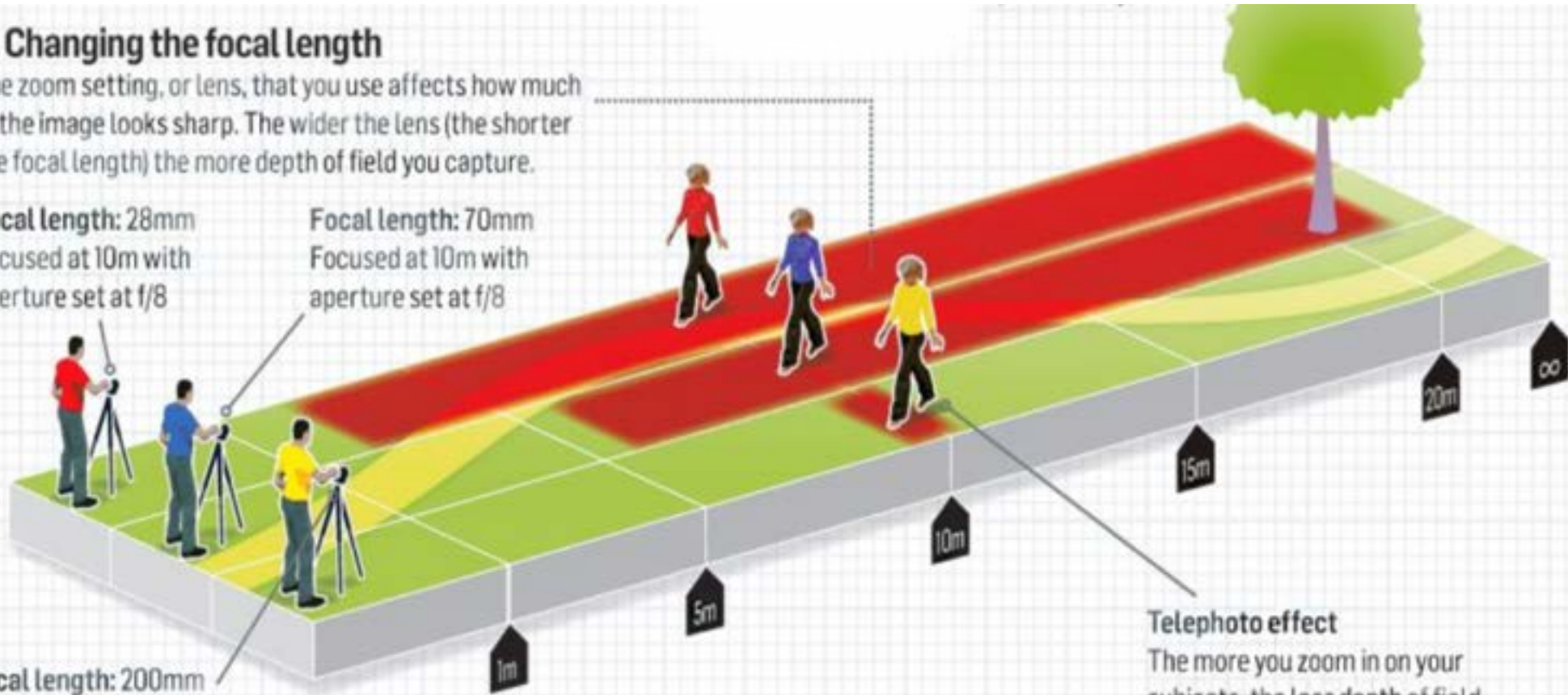
## 3. Changing the focal length

The zoom setting, or lens, that you use affects how much of the image looks sharp. The wider the lens (the shorter the focal length) the more depth of field you capture.

**Focal length: 28mm**  
Focused at 10m with  
aperture set at f/8

**Focal length: 70mm**  
Focused at 10m with  
aperture set at f/8

**Focal length: 200mm**  
Focused at 10m with  
aperture set at f/8



**Telephoto effect**  
The more you zoom in on your subjects, the less depth of field you'll capture on camera.

# Depth of field

Normally use aperture to set depth of field

But

Changing your lens can dramatically change your DoF

Try using 70-300mm zoom on mid distance subjects to make them stand out.

This is why it is difficult to take crisp shots with a long focal length zoom – e.g. 500mm very small D.o.F. (apart from lens quality that is).



# New topic - Histograms

Histograms can be viewed on a lot of cameras but are rarely used

Post processing software also provides histograms but also infrequently used

Histograms are a graph of the light in your picture

Understanding histograms will let you improve the shot you are taking or have taken...

# Histograms

The light in your photograph is recorded in 256 levels from 0 no light to 255 brightest light

Your image holds this information for each pixel in your image in red, green and blue

Histogram either shows three bar charts Red, Green & Blue or a composite bar chart of all three

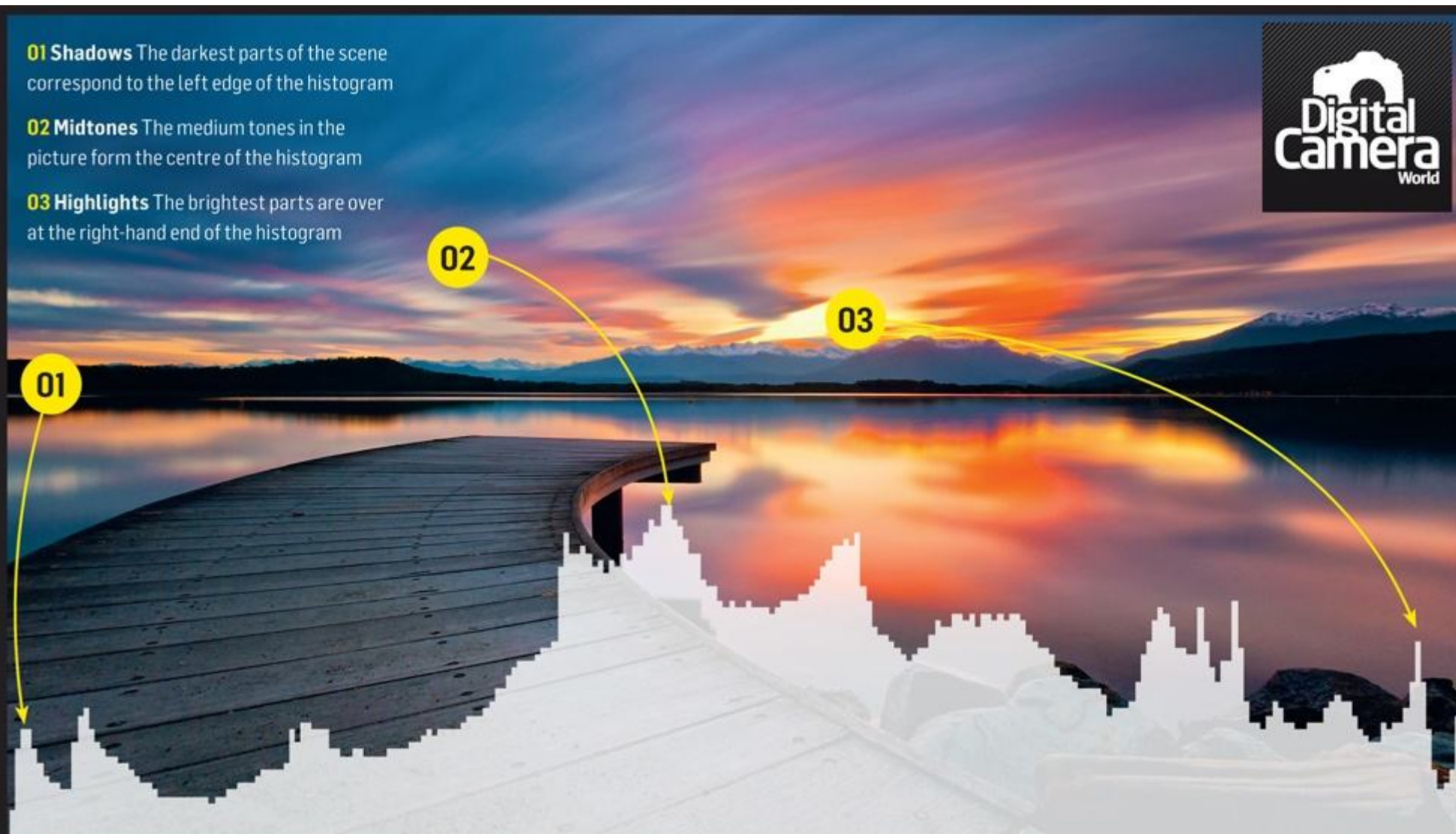
Let's see...

# Histograms

**01 Shadows** The darkest parts of the scene correspond to the left edge of the histogram

**02 Midtones** The medium tones in the picture form the centre of the histogram

**03 Highlights** The brightest parts are over at the right-hand end of the histogram



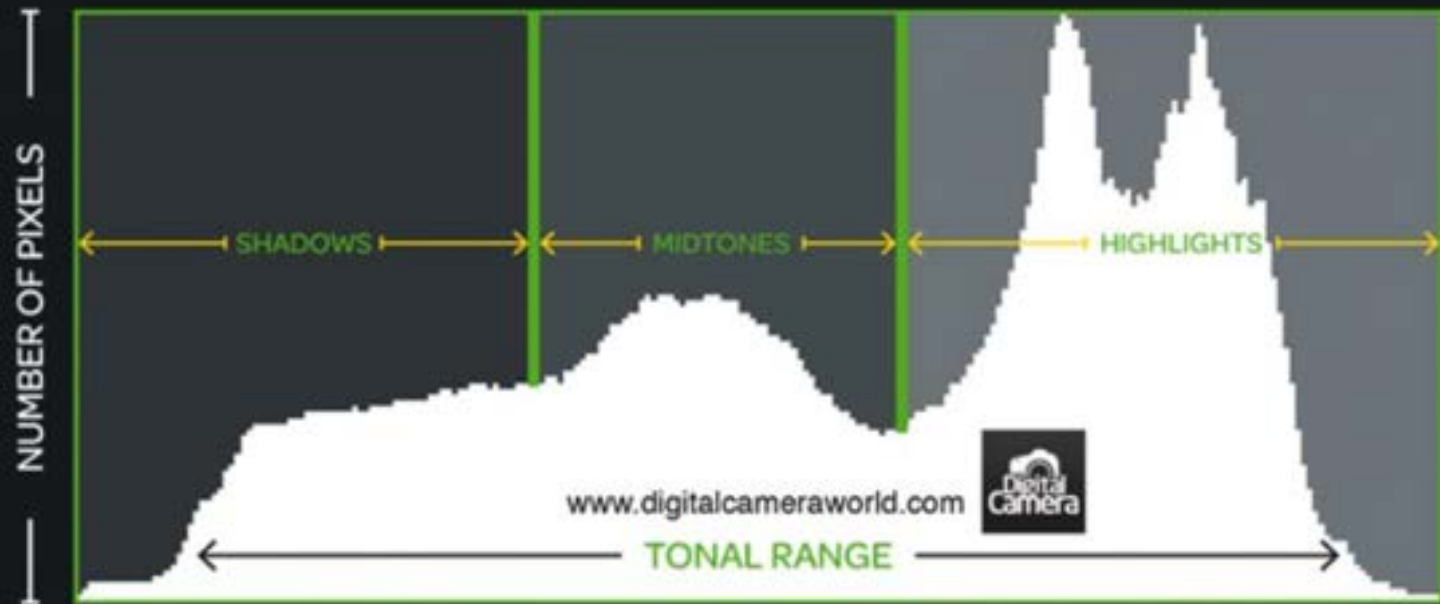


# Histograms

## EXPLAINED HOW TO READ A HISTOGRAM

A camera's histogram is an accurate guide to exposure, as it illustrates the range of tones, or brightness levels, present in an image. You

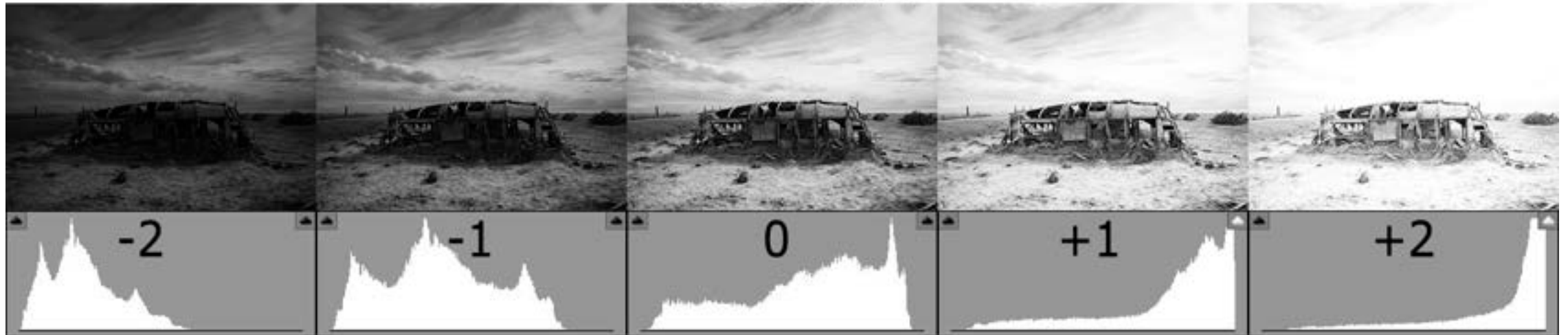
should review the histogram each time you take a picture, so that you can assess if you need to make any exposure adjustments.



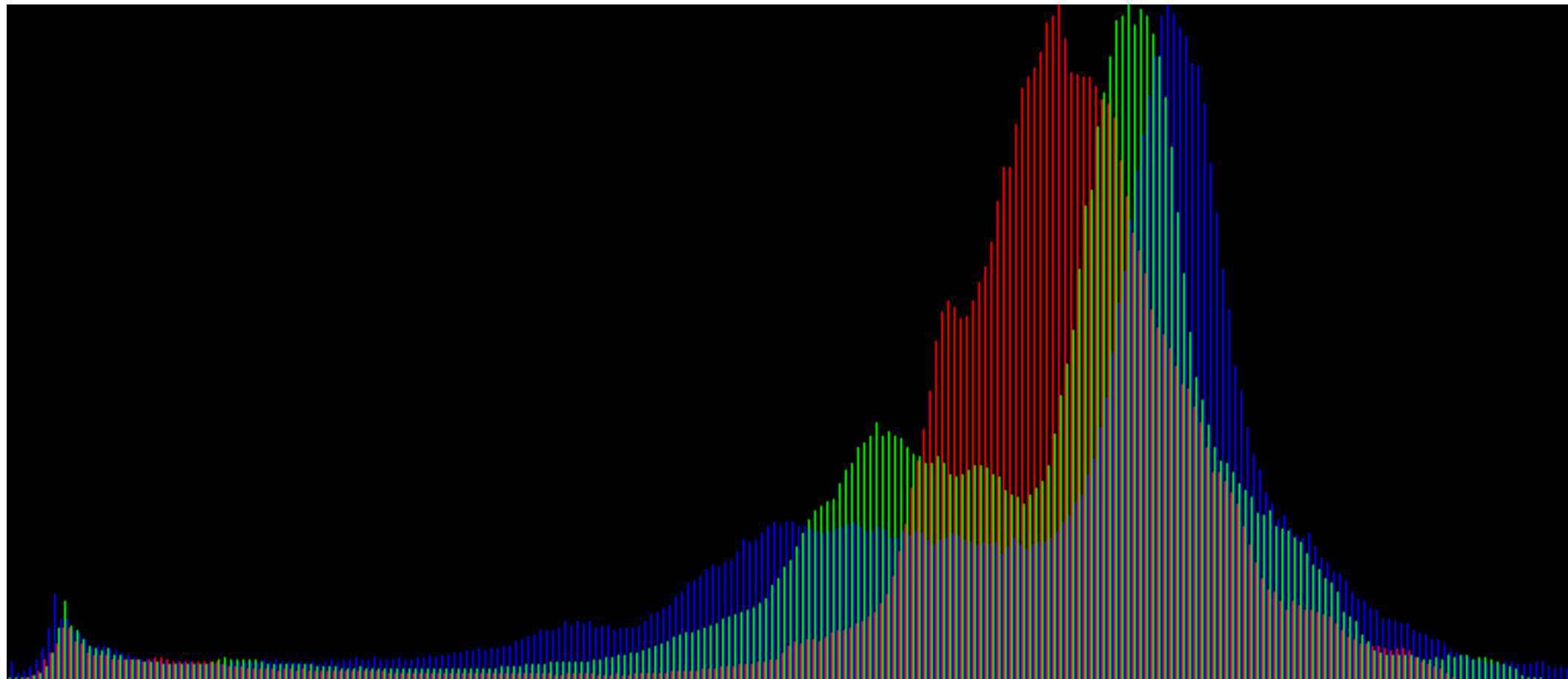


# Histograms

EXPOSURE



# Histograms





# Histograms

And now let's look at what happens if we manipulate the histogram....