



Buying Lenses - a quick guide...

Critical features for considering a purchase

The key to buying a lens is knowing what you want to achieve with it and having a clear idea of your budget. There is a wide range of lenses to buy for most cameras. Each has a different set of characteristics. Since a lens can easily cost more than your camera choosing a lens is a search for something that does what you want at a price you can afford. You need to know some basics first about the critical features...

Primary considerations -

1. **Focal length:**
 - a. Measured in millimetres
 - b. Smaller focal lengths provide wider angles of view
 - c. Longer focal lengths show less of the scene and tend to magnify the view
 - d. Distortion may be found at the extremes of focal length
2. **Aperture:**
 - a. Measured in f stops (eg. f2.8 [wide open] f5.6 [medium], f16 [small aperture])
 - b. Wide aperture lets in most light – faster shutter speeds possible (eg. F2.8)
 - c. Small aperture lets in less light – requires longer shutter opening (eg. F22)
 - d. Wide aperture provides short depth of field
 - e. Smaller apertures gives sharpness throughout the depth of the picture
 - f. Zooms - Aperture size gets smaller with increase in focal length
3. **Stabilisation:**
 - a. Slow shutter speeds mean more chance of camera movement = blur
 - b. Stabilised lenses typically give one or two f stops smaller aperture without more blur as the stabilisation compensates for movement
 - c. Cost is higher if the lens is stabilised
 - d. Canon = IS (image stabilisation); Nikon = VR (vibration reduction); Sigma = OS (optical stabilisation); etc...
 - e. Stabilisation may be in the camera rather than the lens

Secondary considerations:

4. **Optical characteristics**
 - a. Glass optical quality varies with the production process and the ingredients in the glass.
 - b. Each manufacturer has a specific type of glass used for higher quality lenses
 - c. More lenses/lens groups reduces the light
 - d. Optical aberrations result from lenses with high reflective qualities
 - e. Lens optical coatings reduce aberrations and flare
 - f. Distortions are caused by specific groupings of lenses
5. **Motors/drives:**
 - a. Used to drive the aperture control; stabilisation and auto-focus
 - b. Sometimes noisy – not desirable for wildlife shots
 - c. Adds a lot of weight to the lens
 - d. Not necessary on manual-focus prime lenses
 - e. Some cameras have them only for auto-focus
 - f. Older lens models have slower, sometimes heavier, often noisier motors
6. **Weight:**
 - a. Often forgotten attribute!
 - b. Weight often increases with wider apertures – fast lenses are sometimes too heavy for some people to use without excessive movement
 - c. Some motors for stabilisation put a lot of weight on the lens too
7. **Sensor optimisation**
 - a. Lens focal lengths are usually stated for full-frame cameras (quoted as for 35mm sensors)
 - b. Cropped sensors increase the lenses' magnification. Eg. Canon APS-C lenses are optimised for the Canon cropped sensor. The crop factor is 1.6. So a 100mm lens on a Canon 450D is actually equivalent to a 160mm focal length on a canon full frame camera like the 5D.
 - c. Different crop factors apply to different manufacturers and cameras
 - d. Some optimised lenses will not fit different sensor sized cameras – APS-C lenses do not fit canon full frame cameras

8. Zoom vs. Prime

- a. Zoom lenses give you a variable focal length; you control magnification
- b. Prime lenses have fixed focal length. Move nearer/further to change the angle of view.
- c. Zooms give you focal control over the framed view
- d. Primes tend to be higher quality lenses, sharper, faster (wider apertures)
- e. Primes more compositionally challenging
- f. Primes - colours and exposure control more realistic

Why you want this lens...

Make sure you know why you are buying your lens. Consider these:

Fisheye lenses (8 – 18mm on cropped sensor; 14 – 18 mm on full frame)

- Introduces central focus with peripheral distortion
- Highly creative focus provides extreme visual views drawing the eye to the centre
- Used primarily for highlighting specific subjects or attributes of the scene

Wide angle lenses (16 – 24 mm on cropped sensor) (24 – 35 mm on full frame sensor)

- Used for getting wide views of the subject; sweeping view across a scene.
- Some optical distortion at the very wide end accentuates central subjects
- Tend to be used by landscapers; often capable of very small apertures (f22 – f36)

Standard zoom lenses (35mm to 200mm of varying focal lengths)

- Provide great flexibility because can change from wide angle to magnification
- Quality often highly price dependent
- Optical quality variable with change in focal length
- Very long focal lengths often have high f-stops (eg. F5.6)

Standard prime lens (50mm)

- Sees approximately what the human eye sees (full-frame sensor cameras)
- Slightly wide angle for cropped sensors
- Usually good low light performance because of aperture size is usually wide
- Approx.. 80mm for cropped sensors – good for portraits
- Creativity allows for the same flexibility that the eye sees
- Controlled angle of view is determined by photographers position (no zoom control)

Standard prime lens (80mm)

- Ideal (according to some) for full-frame sensor work for portraits

Zoom lenses (long focal lengths 50 to 600mm)

- Sometimes dubious quality in some parts of the zoom
- Flexible for many purposes, but especially wildlife photography at longer focal lengths
- Ideal for getting 'into' the shot
- Creativity related to the placement of the subject in the frame; angle of view variable

Extreme zooms (350 – 800mm zoom ranges)(exceptional long range lenses greater than 800mm available)

- Extreme expense – (expect to pay around £5,000 for the 800mm sort of focal length)
- Excellent for specialist wildlife and long range work
- Angle of view very limited at extreme end
- Very heavy - absolutely requires tripod for longest ranges.
- Really only supportable for specialist work (professional wildlife photographer)
- Cheaper to hire for the odd trip

Macro (from around 35mm to 200 mm) (sometimes achieved using extension tubes)

- Used to get close-up shots of very small subjects.
- Focal length is artificially extended to magnify for close-up work – aim to get 1:1 or larger result
- Can be used for longer views; tends to be at restricted apertures for non-macro work
- Great for magnification shots.
- Great creativity scope

Tilt and Shift

- Specialist - for control of where to place sharpness in the depth of field OR how to deal with converging parallels (lines in the road or converging verticals in buildings)