



# *Lenses: An Overview*

# Investment & Brands

- When it comes to investing in photography equipment, investing in good quality lenses is key.

The lens is the camera's eye, so the better quality lens you use the better quality imagery you will be able to produce.

SLR camera bodies come and go (and are certainly not as long lasting as traditional film SLRs.) Lenses, on the other hand, tend to maintain their value over time and so, overall, make a better investment.

- What brand of lens to choose?

Lenses are made to work exclusively with certain brands of cameras. Both Nikon and Canon have a wide range of lenses on offer that work exclusively with their DSLRs. Third party manufacturers such as Sigma and Tokina also make lenses which can be purchased with either Canon or Nikon mounts. These brands tend to be lower priced, but usually at the sake of quality.

# Full-Frame vs. Cropped Frame

- Your choice of lens selection will vary depending on what type of camera you shoot (full frame like the Canon 5D Mark II, or cropped like the Nikon D90).
- Full frame means that the camera's sensor is the same size as frame of 35mm frame of film. A crop sensor is one that is smaller than a full frame sensor.
- Shooting a cropped camera has the effect of multiplying the focal length by between 1.3-1.6x (i.e. a 35mm lens would be 56mm on a cropped sensor camera.)
- The same lens will produce different results depending on the size of your camera's sensor. If you have a 24mm lens because you want a wide angle shot, what you find out is that you are actually shooting at 38mm, which isn't really wide angle.

# Selecting Outdoor Locations

- Subject to the season

Mid/late spring, summer, early fall best for shooting outdoors, although winter can make for some stunning and unique portraits. Each season offers different colours, tones, quality of light and feeling to an image.

- Consider your subject & style

The setting should reflect your subject and help to achieve the style of image you're going for.

- Look for settings that offer interesting textures, colours, lines, and visually appealing backdrops

- Watch for busy backgrounds and avoid over-crowded places.

- If possible, check your location prior to shooting at about the same time you plan to shoot

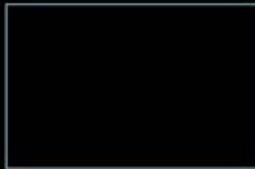
Outdoor locations can change and a walk through can help you identify how best to use the site.



**FULL FRAME SENSOR**



**NIKON CROP SENSOR**



**CANON CROP SENSOR**



**FULL FRAME**



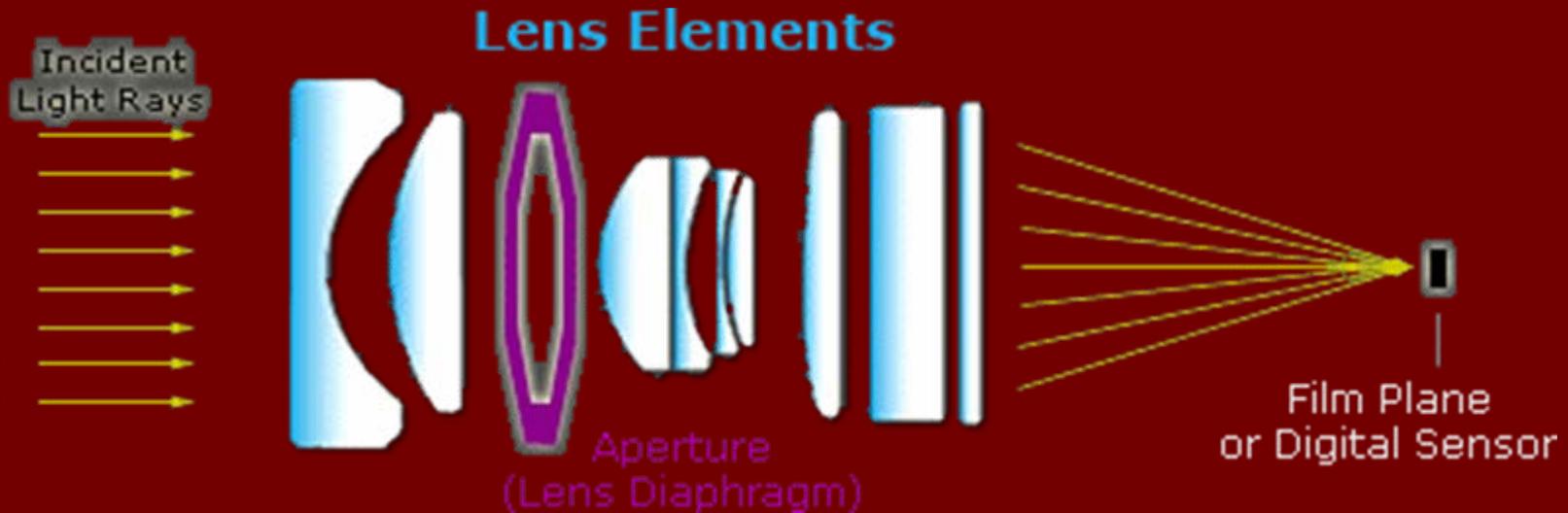
**NIKON CROP SENSOR**



**CANON CROP SENSOR**

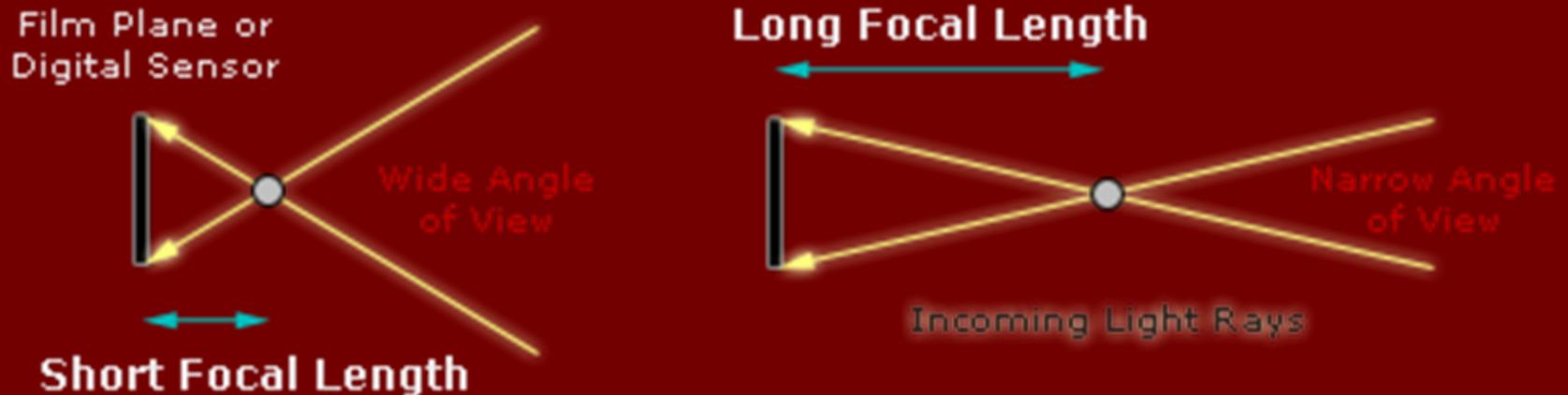
# Lenses: A Look Inside

All but the simplest cameras contain lenses which are actually comprised of several "lens elements." Each of these elements directs the path of light rays to recreate the image as accurately as possible on the digital sensor.



# Lenses: A Look Inside

The focal length of a lens determines its angle of view, and thus also how much the subject will be magnified for a given photographic position. Wide angle lenses have short focal lengths, while telephoto lenses have longer corresponding focal lengths.



# Understanding the Numbers

The following table provides an overview of what focal lengths are required to be considered a wide angle or telephoto lens, in addition to their typical uses. Please note that *focal lengths listed are just rough ranges*, and actual uses may vary considerably; many use telephoto lenses in distant landscapes to compress perspective, for example.

<b>Lens Focal Length</b>	<b>Terminology</b>	<b>Typical Photography</b>
Less than 21 mm	Extreme Wide Angle	Architecture
21-35 mm	Wide Angle	Landscape
35-70 mm	Normal	Street & Documentary
70-135 mm	Medium Telephoto	Portraiture
135-300+ mm	Telephoto	Sports, Bird & Wildlife

# Understanding the Numbers

When one is considering purchasing a lens, specifications ordinarily list the maximum (and maybe minimum) available apertures. Lenses with a greater range of aperture settings provide greater artistic flexibility, in terms of both exposure options and depth of field. The maximum aperture is perhaps the most important lens aperture specification, which is often listed on the box along with focal length(s).

Typical Maximum Apertures	Relative Light-Gathering Ability	Typical Lens Types
f/1.0	32X	Fastest Available Prime Lenses (for Consumer Use)
f/1.4	16X	Fast Prime Lenses
f/2.0	8X	Fastest Zoom Lenses (for Constant Aperture)
f/2.8	4X	Light Weight Zoom Lenses or Extreme Telephoto Primes
f/4.0	2X	
f/5.6	1X	



# Prime Lenses vs. Zoom Lenses

- A zoom lens can vary the focal length within a pre-defined range, whereas this cannot be changed with a "prime" or fixed focal length lens.
- The primary advantage of a zoom lens is that it is easier to achieve a variety of compositions or perspectives (since lens changes are not necessary). This advantage is often critical for dynamic subject matter, such as in photojournalism and children's photography.
- Prime lenses existed long before zoom lenses were available, and still offer many advantages over their more modern counterparts. When zoom lenses first arrived on the market, one often had to be willing to sacrifice a significant amount of optical quality. However, more recent high-end zoom lenses generally do not produce noticeably lower image quality, unless scrutinized by the trained eye (or in a very large print).

# Prime Lenses vs. Zoom Lenses

- The primary advantages of prime lenses are in cost, weight and speed. An inexpensive prime lens can generally provide as good (or better) image quality as a high-end zoom lens. Additionally, if only a small fraction of the focal length range is necessary for a zoom lens, then a prime lens with a similar focal length will be significantly smaller and lighter.
- The best prime lenses almost always offer better light-gathering ability (larger maximum aperture) than the fastest zoom lenses — often critical for low-light sports/theater photography, and when a shallow depth of field is necessary.
- For compact digital cameras, lenses listed with a 3X, 4X, etc. zoom designation refer to the ratio between the longest and shortest focal lengths. Therefore, a larger zoom designation does not necessarily mean that the image can be magnified any more (since that zoom may just have a wider angle of view when fully zoomed out). Additionally, digital zoom is not the same as optical zoom, as the former only enlarges the image through interpolation. Read the fine-print to ensure you are not misled.



# Types of Lenses: Standard/Standard Zoom

- A standard lens will let you create an image similar in perspective and scale to what the human eye sees. A standard lens doesn't change the size of an object or add distortion to the subject in an image.
- A standard lens is one that has a focal length between 35 and 85mm and a standard zoom usually offers a variety of focal lengths within this range. The most common standard lens is the 50mm, which is known as a normal lens. The reason for this is 50mm is very close to what our eyes experience in real life.
- Standard lenses for 35mm film cameras were 50mm while standard lenses for digital cameras with a smaller APS sensor have a 35mm focal length.
- Standard lenses are great for portrait photography. They often have a large range in versatility when it comes to depth of field.



# 35mm Example Shots



# 35mm Example Shots



# 35mm Example Shots



# 50mm Example Shots



# 85mm Example Shots



# 85mm Example Shots



# Types of Lenses: Wide Angle Lenses

- A wide angle lens is a lens that has a focal length less than 28mm. These lenses give a wide view and are often used for landscapes, close subjects and tight spaces. Wide angle zooms are also available.
- Ultra/wide angle lenses are good for capturing a large scene. They can exaggerate depth in an image and they often cause you to move closer to your subjects which means you give emphasis to the front while still capturing the background. For example, if you're photographing something such as a field full of flowers, by getting as close to the flower nearest to you as possible will exaggerate the size but you'll also be able to see the rest of the field.
- Wide angle lenses are also good for architectural photography as the wider the view you have available for this sort of work, the less distortion there will be. You can also use this lens for portraits to add an interesting, unique angle to your work but be careful, as it can make parts look extremely large and distorted.



# Example Wide Angle Shots



# Example Wide Angle Shots



# Types of Lenses: Fisheye Lenses

A fisheye lens makes everything you take look like it's in a Goldfish bowl. A fisheye lens creates an extremely wide angled image which appears convex/circular. It's a useful tool for getting in close to something and still retaining the detail of the surroundings. It's also great for creating unique looking images.



# Example Fisheye Shots



# Example Fisheye Shots



# Types of Lenses:

## Telephoto & Super Telephoto

- The telephoto lens is any lens that has a focal length greater than 100mm.
- These are very useful when you are unable to get as close to a subject as you would like.
- Super telephotos have focal lengths greater than 400mm and are used frequently for wildlife and sports photography.
- Typically, the larger the focal length of the lens, the larger the lens itself. Super telephotos are often so heavy they require the use of a tripod.



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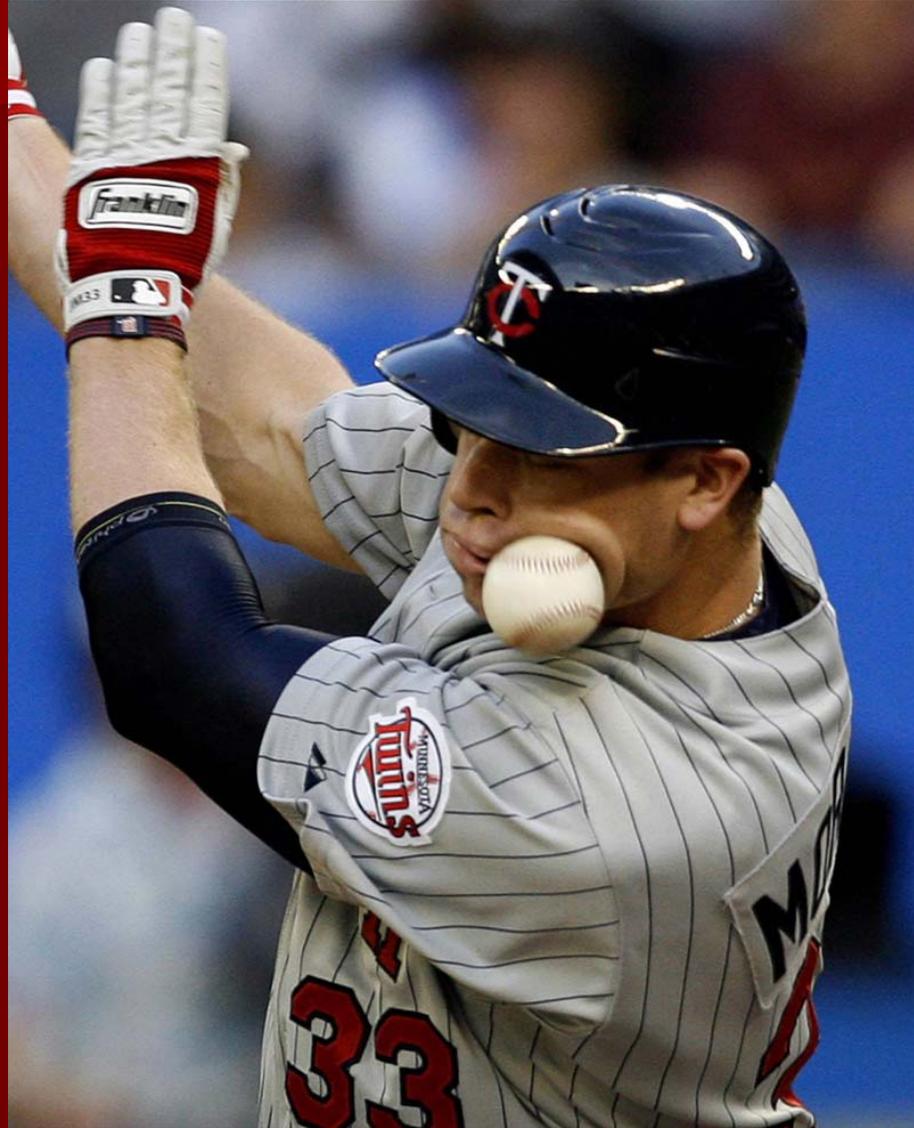


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# Example Telephoto Shots



# Example Telephoto Shots



# Types of Lenses: Super Zooms

- Super zooms offer an almost complete range of focal lengths in one lens.
- This wide range means that you can achieve a variety of looks usually requiring multiple lenses and saves you time having to switch lenses during shooting, It also saves you from having to carry a bunch of equipment. The trade off is cost as super zooms are typically priced in the \$800-\$1200 range.



# Types of Lenses: Macro Lenses

- A macro lens is one type that has a much more specific function. The main purpose of this lens is that it allows you to get very close to a subject and get great details. For example if you wanted to go take a picture of a flower and be able to see more detail than your eye would naturally be able to see, this lens is perfect.
- You can also get in close to photograph details of larger objects. They're also useful for product photography and for capturing other small objects. Macro lenses have a limited depth of field (how much of the image is sharp and in focus) so it is important you frame and focus on the most important part of your image.

# Example Macro Shots



# Example Macro Shots



# Example Macro Shots



# Recommended Kit

- The lenses you acquire will largely be dependant on the type of photography that interests you and your budget.
- However, an ideal kit should include a range of focal lengths offering a slightly wide angle to a good telephoto. This would mean having a kit that includes lenses at the 16-24mm range, the 35-50-85mm range through to the 200-300mm range
- This can be achieved via a variety of prime lenses, via one standard zoom and one telephoto zoom, or with a super zoom like the 18-200mm.
- Renting lenses from either Don's Photo in Winnipeg or via one of several on-line lens rental firms is a great way to try out and experiment with lenses prior to buying and a great way to access specialty lenses.

# Other Lens Features to Consider

## Image Stabilization

- Many DSLRs feature sensor-based image stabilization, whereby the sensor moves to counteract the effects of camera shake. Some DSLR manufacturers, such as Canon and Nikon, have this in their lenses instead, which works by moving dedicated elements inside the lens to achieve the same effect. Those in Canon's range are distinguishable by the 'IS' suffix, while Nikon uses 'VR.'

## Lens Hoods

- Wide angle lenses in particular are prone to flare, given the wide angle of view they cover. As well as introducing flare streaks this can lead to an overall loss of contrast in an image, and so they are generally provided with a lens hood which stops extraneous light from entering the field of view. The problem isn't exclusive to wide angle lenses though, with many lenses – be they wide angle, standards, super zoom or telephoto varieties – supplied with lens hoods.

# Other Lens Features to Consider

## UV Filter

A typical UV filter in photography is transparent to visible light while filtering out shorter ultraviolet wavelengths. Historically, some photographic films were sensitive to UV light, which caused haziness or fogginess, particularly with a blue hue. However, newer photographic film and digital cameras are highly insensitive to UV wavelengths.

Many photographers still use UV filters as protection for their lenses, due to their low cost and lack of effect on the exposure of the shot. However, UV filters (in particular filters lacking optical coating) may introduce lens flare and have an adverse impact on contrast and sharpness, especially when a strong light source is present.