

Photography

Week 5

Lighting

Light can affect the feeling of a photograph so that a subject appears, for example, brilliant and crisp, hazy and soft, harsh or smooth. If you make a point of observing the light on your subject, you will soon learn to predict how that light will affect your photographs, and you will find it easier to use existing light or to arrange the lighting yourself.

Lighting Demonstration - Direction

Direction Of Light

The direction of light is important because of where the shadows fall.

Front lighting – safe but can lack depth.



Side lighting – adds texture and depth.



Backlighting/Rimlighting – requires special care to avoid lens flare but can be very dramatic.



Before you create an image, take a moment to consider your alternatives.

Lighting Demonstration- Quality

Degree Of Diffusion

When people refer to the “quality” of light, they usually mean its degree of diffusion, which can range from contrasty and hard edged, to soft and evenly diffused.

Direct (Hard)Light – Creates hard-edged, dark shadows. Very distinct direction.
Highlights are specular.



Diffused (Soft) Light –

Scatters light onto the subject from many directions. Shows little or now directionality.
Shadow edges are indistinct.



Directional-diffused Light –

Partially direct with some diffused or scattered rays. Shows distinct direction, but with soft shadow edges. Used for traditional portraits.



Available light – Outdoors.

Available light – the light that already exists in a scene.

A clear, sunny day creates bright highlights and dark, hard-edged shadows.



On an overcast day, at dusk, or in the shade, the light will be diffused and soft.



The light changes as the time of day changes.



Portrait photographers prefer overcast days or shooting during the early morning or late day – NOT NOON.

What time is it?
Hint: that is the moon.



Complete overcast -beautiful!



Available light - Indoors

Can be contrasty



or flat, depending on the sources of light.



Light indoors is often relatively dim so a higher ISO, slower shutter speed and wider aperture will be needed. Try to use available light as often as possible. Flash photos will produce "safe" front-lit images that may lack a creative feel.

Indoor light will also vary in its "color temperature", and will create an overall color cast in your images, if you don't set a white balance for them, or the lab doesn't color correct them.

Incandescent Light



Florescent Light



Mercury Vapor Light



Window Light



Simple Portrait Lighting

You don't need a complicated lighting arrangement for portraits – or many other subjects

Outdoors, open shade or an overcast sky provides a soft, even light.

Indoors, window light is a convenient source of light during the day.

A main light plus reflector fill is the simplest setup if you want to arrange the lighting yourself.



Lens / Perspective

Light must be controlled if our eyes or our cameras are to form images of objects. All photographic lenses do the same basic job; they collect light rays coming from a scene and project them as images onto the media at the back of the camera.

From Pinhole To Lens

Although all the light rays reflected from an object cannot produce an image, a selection of rays can.

The trouble with a pinhole camera is its tiny opening which requires extremely long exposure times.

A lens creates a sharp image with a relatively short exposure.

Most modern photographic lenses are based on the convex lens (thicker in the middle).

Bending light (refraction). Concave lenses spread light rays apart, convex lenses bend them toward each other.

Focal Point - where the light rays cross each other and the image is in focus.

Lens Focal Length

The most important way lenses differ is in their focal length.

Focal Length: Technically - the distance between the lens's rear nodal point and the focal plane when the lens is focused on infinity. Commonly known as the lens length (i.e.50mm)

Focal length controls magnification.

Focal length controls angle of view (amount of the scene shown).

Normal

Normal Focal Length: Approximates the impression human vision gives. (roughly 47-50 degrees).

A "normal" lens is when the focal length of the lens is approximately the same as the diagonal measurement of the film used.

A lens that is a normal focal length for one camera can be a long focal length for another camera.

Advantages of a normal focal length lens: faster (wider maximum aperture), less expensive, more compact, lighter weight.

Choice of focal length is a matter of personal preference.

Long

A long -focal-length lens provides greater image magnification and a narrower angle of view than a normal lens.

Long lenses are excellent when you cannot or do not want to get close to the subject. Also produce better portraits.

Qualities to use: Less depth of field. Perspective: objects seem to be closer together than they really are.

Disadvantages:

- Heavier, bulkier, more expensive.

- Because of shallow depth of field - must be focused accurately.

- Slow - do not open to a very wide aperture (typically f/4 on a 200mm).

- Difficult to use for hand-held shots since they magnify movement as well as image size.

Trivia: Photographers commonly call any long lens a telephoto although not all long lenses are of telephoto design. A true telephoto lens has an effective focal length that is greater than the distance from lens to media plane.

Short

A short-focal-length lens increases the angle of view and shows more of a scene than a normal lens used from the same distance.

Wide-angle lenses have considerable depth of field.

Pictures taken with a wide-angle lens can show both real and apparent distortions.

A lens of very short focal length requires some design changes for use in a single-lens reflex camera.

Zoom

Zoom lenses are popular because they combine a range of focal lengths into one lens.

Advantages: Convenience of not changing lenses. Very useful when using slide film when later cropping is difficult. Image quality close to that of fixed-focal-length lenses.

Disadvantages:

More expensive, bulkier, heavier.

Slower - smaller maximum aperture.

The best prices and fewest drawbacks are found with a modest zooming range i.e. 35 to 105 for 35mm.

Fixed Aperture vs. Variable Aperture.

A fixed aperture zoom lens i.e. f/2.8 will be able to open up to an f/2.8 no matter what focal length is chosen. A variable aperture zoom lens i.e. 3.5-6.3, will only be able to achieve an f/3.5 at the shortest focal length chosen. As the lens zooms out to a longer focal length, the smallest aperture possible will vary from f/3.5 to f/6.3 at the longest focal length of the lens. A fixed aperture zoom lens can cost considerably more than a variable aperture zoom lens.

Special-Purpose Lenses

Fisheye lens.

Widest of the wide angle views - up to 180 degrees. Barrel distortion (an optical aberration that bends straight lines into curves at the edges of an image) must be considered.

Produce the greatest depth of field.

Macro Lens.

Useful for extreme close shots. Also called (incorrectly) a micro lens.

Has very shallow depth of field - must be focused accurately.

Catadioptric (mirror) Lens

Incorporates curved mirrors as well as glass elements within the lens to produce a very long focal length lens that is much smaller and lighter than a lens of equivalent focal length that uses only glass elements.

Cat lenses have a fixed aperture, usually f/8 or f/11.



Focusing Your Lens

The sharpest area of the photograph will grab the viewers' attention.



Automatic

Simplest design - partially push down the shutter-release button and the camera adjusts focus to whatever is in the center of the frame (if that's the mode you're in)

Biggest advantage: focuses faster than hand eye coordination needed to focus manually.

Problems:

- Subject has very low contrast.
- Subject is in very dim light.
- Subject consists of a repetitive pattern.
- Subject is moving.

Manual

You adjust the lens to select the part of the scene you want to be the sharpest. Allows you to be most creative.

The nearer you are, the more important it is to focus critically.

Focus an image like you would tune a guitar - go a little past the point you think is correct, then come back.

Follow focus lets you keep a subject that is moving toward you well focused.

Focus And Depth Of Field

What is sharp? In theory, a lens can only focus on a single distance.

Depth of field is the part of a scene that appears acceptably sharp in a photograph.

Trivia: Usually the depth of field extends about one-third in front of the critical plane of focus and two thirds behind (unless when focusing very close to a subject when it is about evenly divided.)

Controlling Depth of Field

Evaluating and controlling the depth of field is more important in some situations than in others.

Controlling depth of field:

Increasing the depth of field:

- set the lens to a smaller aperture (will also have to use a corresponding slower shutter speed)
- use a shorter focal length lens
- step further away from the subject

Decreasing the depth of field:

- use a wider aperture
- use a longer lens
- get closer to the subject

A lens of longer focal length produces less depth of field than a shorter lens used at the same f-stop because the longer lens's aperture is physically larger than the shorter lens's aperture - therefore the circles of confusion are also larger.

Zone Focusing

A way of focusing that lets you set the depth of field in advance of shooting.

Preset the focus on the lens by estimating the distance to the subject and wait for the subject to enter that area.

Perspective

Perspective is controlled by the lens-to-subject distance, not by the focal length of the lens.

Perspective Demonstration



Choosing Lenses

The “speed” of a lens affects its price. The wider the maximum aperture, the more costly - but do you need it?

Guidelines for buying camera lenses

Start with a normal lens or a zoom lens with a moderate-focal-length range if you are getting a camera with interchangeable lenses.

Get your lenses one at a time and think ahead to the assortment you may need someday.

Don't spend money on extra-fast lenses unless you have unusual requirements.

Consider a secondhand lens.

Test your lens.

Buy a lens shade for your lenses.

The InQUIZZition!

ASSIGNMENTS:

Play with perspective. Set up, or find a scene with three elements. Then vary camera distance (keep focal length the same)

1. Vary the focal length of the lens, (keep camera distant constant).
2. Next, vary camera distance (keep focal length the same).