



Hi, I'm Troy Bunch.

Thank you for joining me – Today I'll show how to do great nature photography with your digital camera. We'll take a look at selecting equipment, using your camera, and image composition

This presentation is brought to by the US Fish and Wildlife Service.

Photo Fundamentals

Equipment Selection



The first thing you need to do nature photography is a camera.

There are two basic types of digital cameras



Point and Shoot



Single Lens Reflex (SLR)



There are two basic types of digital cameras “point and shoot” cameras and “single lens reflex” (or SLR) cameras.

Point and Shoot

- Less expensive than SLRs
- Small and light
- Less complicated to operate
- Many newer models have extended optical zooms & image stabilization
- Do very well with extreme close-ups
- Video and audio capability



Point and shoot camera are usually cheaper and more compact than single lens reflex cameras

They are generally easier to use, though some point and shoot cameras can be pretty complex and sophisticated

Many point and shoot cameras on the market today have very good optical zoom lenses with image stabilization to counteract or minimize the effect of camera shake and blurry pictures. There are some that can go all the way to 12 or 18x optical zoom

Most point and shoot cameras can also capture digital video and audio.

Single Lens Reflex

- Highly flexible system with interchangeable lenses and external flash capability
- Gives you much more control over camera functions
- Generally, better image quality and can produce larger prints



SLR's give the photographer much more control of the camera, but this means that are more complex and complicated than most point and shoots

There are hundreds of different lens on the market for single lens reflex cameras - from extreme close-up (macro) lens to some telephoto lens that are as powerful as small telescope

Since the physical size of the image sensor in SLR's are larger than sensors found in point and shoot cameras, they can generally produce higher quality images

Lenses... so many choices



Many of the major camera brands, like Nikon, Canon and Pentax, make a large assortment of lens for their SLR's. Prices are highly variable, but some of the telephoto lenses used for wildlife photography can cost upwards of \$10,000.

Tripods

- Reduces or eliminates camera shake that causes fuzzy pictures
- Get one made of aluminum or carbon fiber
- Needs to extend to at least your height
- Get one that will also allow you to get very low to ground



At some point you will need a tripod to stabilize your camera - especially if you want to get creative, or shoot in low light situations

Beware of cheap, plastic tripods that are often found in discount department stores - buy one made of aluminum or graphite

The tripod should extend to about your height, and have the ability to go very low so you can take pictures close to the ground

Tripod Head



Ball & Socket Head
with Quick Release



You'll also need a tripod head so that you can mount your camera on the tripod - the ball head is used by many nature photographers

Also , it's important to buy a tripod head that is rated to handle the weight of your camera and lens

Ball & Socket Tripod Head with Pistol Grip



This is a ball and socket tripod head with a handle to help you move the camera around

Other Ways to Stabilize Your Camera



If you don't have a tripod, get something that you can use to stabilize your camera, even if it's just bean bag

Flash Memory Cards



CF = Compact Flash

SD = Secure Digital

xD = Proprietary card in some Olympus and Fujifilm cameras



Nearly all digital cameras use flash memory cards to store images - the capacity of these cards ranges all the way from minimal, like 16MB to very large, like 2, 4 or even 8 MB

Most Common File Format - JPEG

- Good format for both web and printing
- You can vary the degree of file compression
- Image data is lost every time a change is made and the file is re-saved
- For archival purposes images should be converted to TIFF
- Some cameras save RAW files – this format provides the greatest latitude for correcting exposure problems, but raw formats are not standardized and images must be passed through a “RAW converter” program before they can be manipulated in an image editor like Photoshop



The most common format that images are stored as is JPEG - this is a good format because it is relatively small and you can set the level of compression, which determines the size and quality of your images

More sophisticated cameras can save images in what's called a RAW format. This format provides the greatest latitude for correcting exposure problems, but raw formats are not standardized and images must be passed through a “RAW converter” program before they can be manipulated in an image editor like Photoshop

Flash Memory Cards



If you have a 10 Megapixel camera...

A 2 GB card will hold about 500 high quality JPEG images (low compression), while you'd get fewer than 10 on a 32 MB card



Don't skimp on the memory card. A 32MB card can hold only 10 or so high quality JPEG images, while a 2GB card can hold as many as 500

Camera Care

- If your camera has been outside in the cold, let the camera come to room temperature gradually to avoid condensation
- Don't leave your camera in the car on a hot day
- Don't store batteries in the camera for extended periods
- Buy a special camera lens cleaning kit – don't use household cleaners or anything not designed specifically to clean camera lens
- If it's raining, cover your camera



Before we move on from equipment, just a couple of important notes about taking care of you camera...

When you bring your camera in from the cold, let it adjust slowly to the warmer temperature to avoid condensation on or in the lens

Don't leave your camera in a hot car

If you're not going to use your camera for and extended period of time, remove the batteries

Buy a special camera lens cleaning kit – don't use household cleaners or anything not designed specifically to clean camera lens

Don't let your camera get wet

Photo Fundamentals

Exposure



Photo Fundamentals - Exposure

Creating a Properly Exposed Image

- Exposure is determined by the amount of light captured by the camera
- Getting the exposure “right” is the essence of a technically good photograph



Exposure simply refers to the amount of light that enters the camera when the shutter release is depressed. A light meter inside your camera measures the light which is then “captured” by the camera’s digital sensor and stored on the flash card

Getting the exposure “right” is the essence of a technically good photograph

Metering Modes

- Some cameras will let you select a **metering mode** to tell it how to measure the light
- **Evaluative** is usually the default setting on most cameras - in this mode the camera averages the light across the entire frame to determine exposure
- **Center -weighted** and **spot** measure the light more toward the center of the frame



Some cameras will let you select a “metering mode” to tell it how to measure the light entering the camera

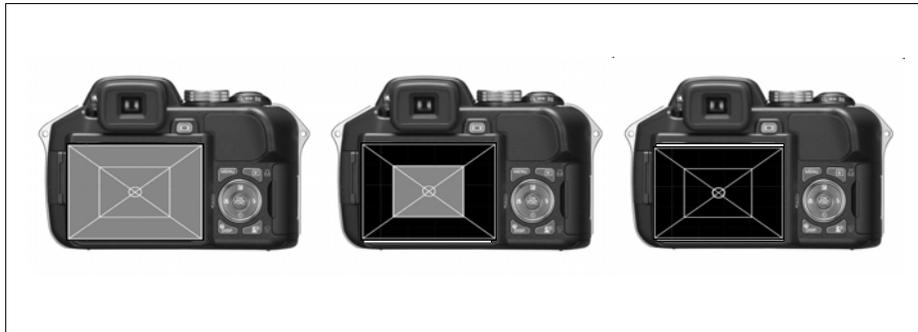
The default, and most commonly used, is Evaluative - the camera measures the light across the entire frame. Center-weighted and spot measure the light more toward the center of the frame

Metering Modes

Evaluative

Center-Weighted

Spot

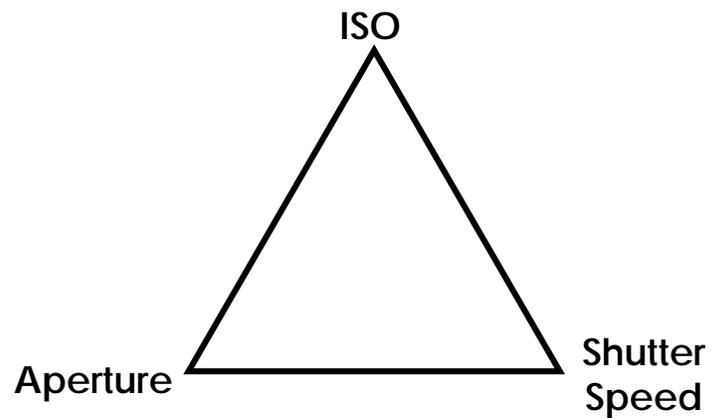


Some cameras will let you select a “metering mode” to tell it how to measure the light entering the camera

The default, and most commonly used, is Evaluative - the camera measures the light across the entire frame. Center-weighted and spot measure the light more toward the center of the frame

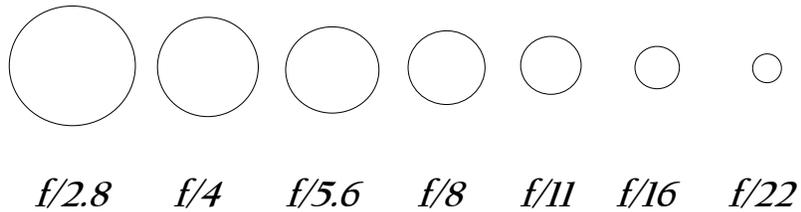
The Exposure Triangle

Exposure is a combination
of these three variables



Exposure is determined by these three variables, ISO, Shutter Speed and Aperture – we'll talk about aperture first

Aperture



Aperture is the size of the opening in the camera lens through which light enters and reaches the image sensor. The size of the aperture is expressed as f stop



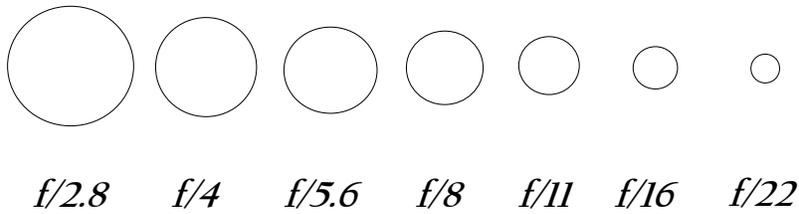
Aperture is the size of the opening in the camera lens through which light enters and reaches the image sensor. The size of the aperture is expressed as f stop

The larger the opening, the smaller the f stop number

The smaller the opening, the larger the f stop number

Aperture

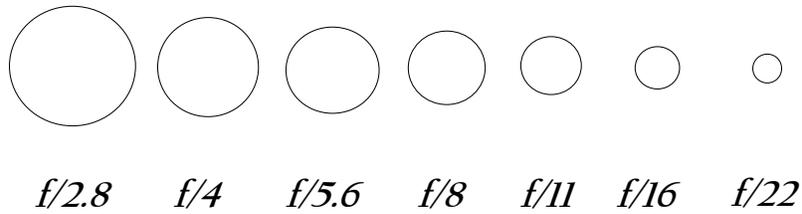
Aperture wide open – the background will be out of focus



With a large aperture setting the background will be out of focus

Aperture

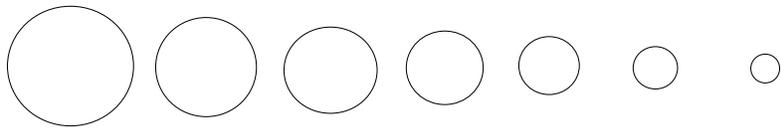
Aperture opening small – both the subject and the background will be in focus



If the Aperture opening is small – both the subject and the background will be in focus

Aperture

Aperture opening
determines Depth of Field



f/2.8 *f/4* *f/5.6* *f/8* *f/11* *f/16* *f/22*



The depth of field in this illustration, from left to right, goes from minimal to maximum – or another way of saying it - from shallow to deep

Aperture

Aperture opening
determines Depth of Field

f/2.8 (large opening) = less depth of field

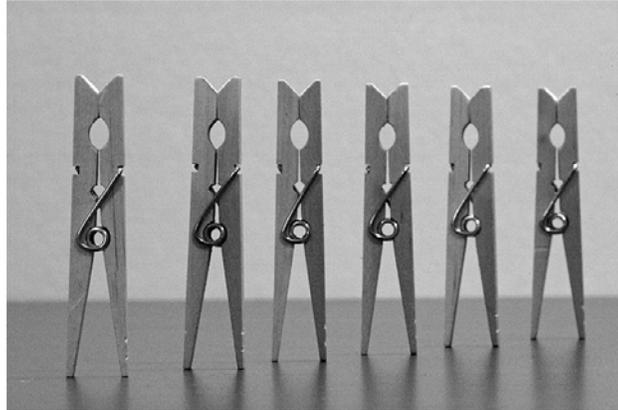


This illustrates a shallow, or minimal depth of field

Aperture

Aperture opening
determines Depth of Field

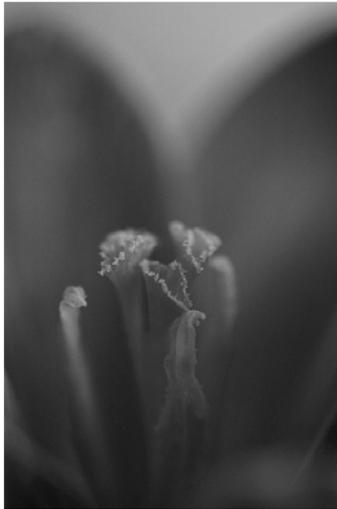
$f/22$ (small opening) = more depth of field



This one illustrates a deep, or maximum depth of field

Aperture

Minimum Depth of Field



You may want a minimal depth of field so that the background is blurred to put the viewer's attention of the main subject

Aperture

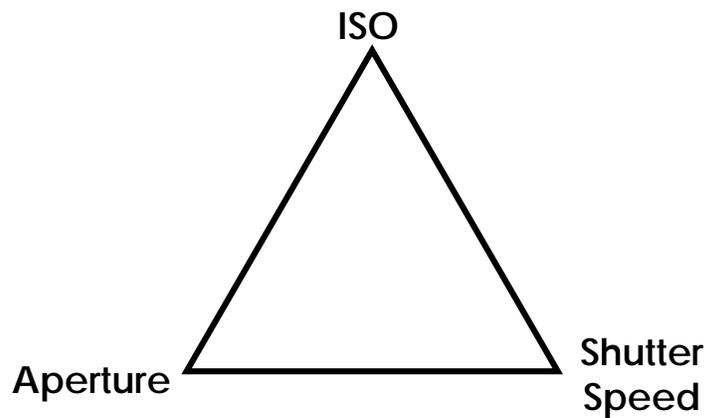
Maximum Depth of Field



Or, you may want a maximum depth of field so that everything in your picture is in focus

The Exposure Triangle

Exposure is a combination
of these three variables



Remember, exposure is determined by these three variables, ISO, Shutter Speed and Aperture – now we'll talk about shutter speed

Shutter Speed

- The shutter in your camera opens then closes when you take a picture - how fast it opens and closes is called **shutter speed**
- Shutter speed settings on a camera are expressed in seconds and fractions of seconds



The shutter in your camera opens then closes when you take a picture - how fast it opens and closes is called shutter speed

Shutter Speed

Slow



Slow shutter speed

Shutter Speed

Fast



Slow shutter speed

Shutter Speed

- When the shutter opens and shuts slowly it lets in more light than when it opens and shuts quickly
- When the aperture is wide open it lets in more light than when the aperture is small
- That's why the aperture and shutter speed pairings below will create an image of approximately the same exposure (but different depths of field)

<i>f/2</i>	<i>f/2.8</i>	<i>f/4</i>	<i>f/5</i>	<i>f/8</i>	<i>f/11</i>	<i>f/16</i>	<i>f/22</i>
<i>1/500</i>	<i>1/250</i>	<i>1/125</i>	<i>1/60</i>	<i>1/30</i>	<i>1/15</i>	<i>1/8</i>	<i>1/4</i>



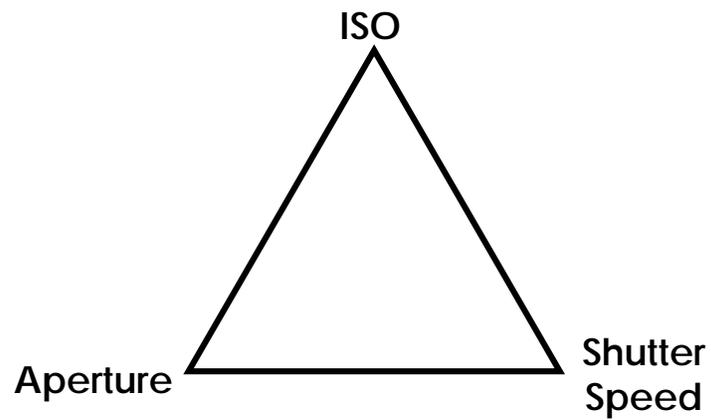
When the shutter opens and shuts slowly it lets in more light than when it opens and shuts quickly

When the aperture is wide open it lets in more light than when the aperture is small

You can see that if you use a fast shutter speed, like 1/500 of a second, with the aperture wide open, you will get approximately the same exposure as when you use a slow shutter speed, like ¼ of a second, with the aperture set to a very small opening.

The Exposure Triangle

Exposure is a combination
of these three variables



The last exposure variable is called ISO

ISO

- The ISO setting determines your camera's image sensor's sensitivity to light
- High ISO settings are required for low light situations, while low ISO settings can be used in bright light
- The problem with shooting in low light where higher ISO settings are needed is that more noise is created - noise reduces image quality



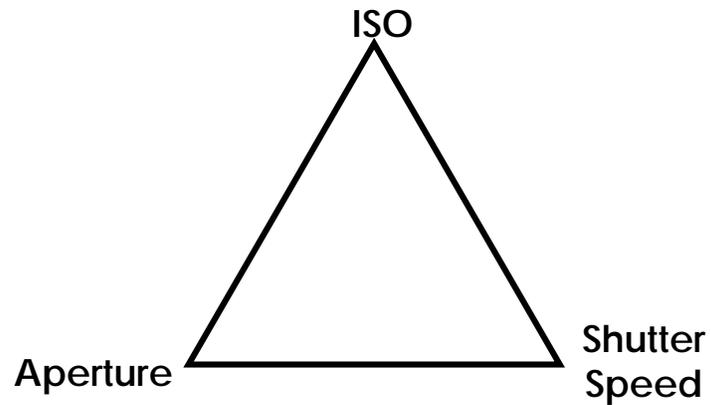
The ISO setting determines your camera's image sensor's sensitivity to light

High ISO settings are required for low light situations, while low ISO settings can be used in bright light

The problem with shooting in low light where higher ISO settings are needed is that more noise is created - noise reduces image quality

The Exposure Triangle

Exposure is a combination of these three variables – all three can be manipulated in your camera to produce the image you want



We've just seen that exposure is a combination of aperture, shutter speed and ISO – all three can be manipulated in your camera to produce the image you want

Exposure Mode Settings

- Automatic
- Scene settings
- Aperture Priority
- Shutter Priority
- Manual



◀ On some cameras you select exposure modes using buttons or a menu.



◀ A Nikon mode dial.



◀ A Sony mode dial.



With the exception of “Manual,” these are all forms of automatic or semi-automatic exposure settings available on almost all cameras – both “point and shoot” and SLR’s

Exposure Mode Setting

Automatic

- Frame your subject in the LCD or optical viewfinder, depress the shutter release button halfway down and hold it there to set and lock-in the exposure setting, then fully depress the shutter release to capture the image
- **The camera sets the aperture, shutter speed and ISO for you**



When set to “Automatic” the camera sets the aperture, shutter speed and ISO for you

There are times when even the most seasoned professional photographer takes a photo with the camera set to automatic

Exposure Mode Setting

Scene Settings

- Pretty much the same as the automatic setting except **you select the most appropriate setting for the situation – landscape, night, close up, under water, fireworks, etc** – and the camera will do the rest



Scene settings are similar to the automatic setting except you select the most appropriate setting for the situation – landscape, night, close up, under water, fireworks, etc – and the camera will do the rest

Exposure Mode Settings

Aperture Priority

- **You set the aperture opening** - the camera determines shutter speed and ISO
- Select small aperture to increase depth of field
- Select large aperture to minimize depth of field



With aperture priority You set the aperture opening - the camera determines shutter speed and ISO

Select a small aperture to increase depth of field

Select a large aperture to minimize depth of field



With landscapes, the photographer generally wants to maximize depth of field



This landscape image was probably shot using a small aperture opening of $f/16$ or $f/22$.



A minimal depth of field focuses the viewer's attention on the main subject of the image



This image was likely shot with a larger aperture, $f/4$ or $f/5.6$ to create a shallow depth of field, which serves to blur what might have been a distracting background.

Exposure Mode Settings

Shutter Priority

- **You set the shutter speed** - the camera determines aperture opening and ISO
- Select a fast shutter speed to freeze motion, or eliminate a blurry picture caused by the camera shaking
- Select a slow shutter speed to create a sense of motion by blurring the action



With shutter priority You set the shutter speed - the camera determines aperture opening and ISO

Select a fast shutter speed to freeze motion, or eliminate a blurry picture caused by the camera shaking

Select a slow shutter speed to create a sense of motion by blurring the action



Freezing the action with a fast shutter speed



A fast shutter speed was used to freeze the action in this picture



Slow shutter speed created this water effect



A slow shutter speed was used to blur the water to create a sense of motion in this photo

Exposure Mode Setting

Manual

- Since **you select aperture, shutter speed and ISO**, you have more control over the creative process of taking pictures
- However, this requires an understanding of the fundamentals of exposure and your camera's controls



In manual mode you select aperture, shutter speed and ISO, giving you more control over the creative process of taking pictures, but... in order to get a good photo

You have to have an understanding of the fundamentals of exposure and your camera's controls

Polarizing Filter

The circular polarizer is one of the most useful filters for outdoor photography

- Reduces glare
- Minimizes reflections from glass and water
- Makes colors appear richer



One last thing that affects the exposure is the use of filters. There are many out there, but the one that is used most is the circular polarizing filter

The polarizing filter helps to reduce glare, minimize reflections off glass or water, and makes colors appear richer

Polarizing Filter



Without filter



With filter



Polarizing Filter – with and without

Polarizing Filter



Without filter



With filter



Polarizing Filter – with and without

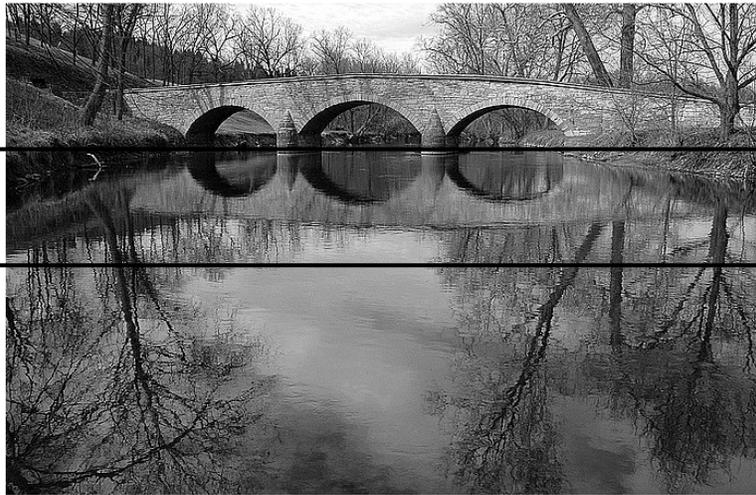
Photo Fundamentals

Composition



Composition

The Artistic Side of Photography



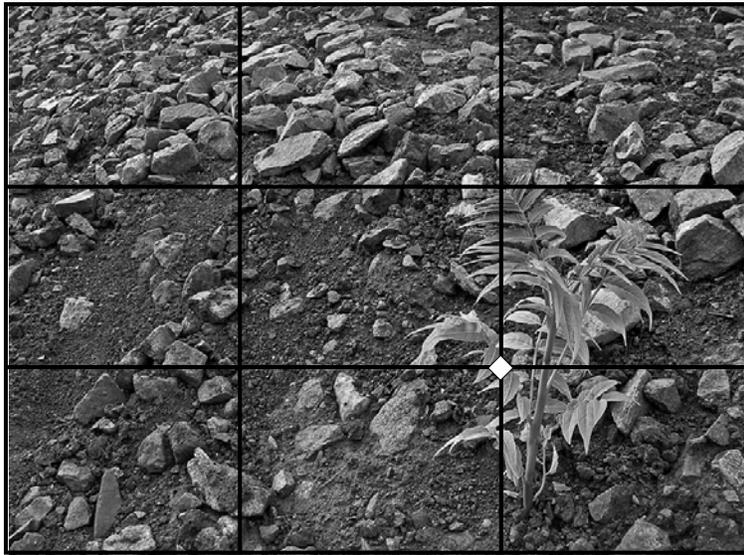
To be a good nature photographer requires both technical knowledge and an understanding of good composition

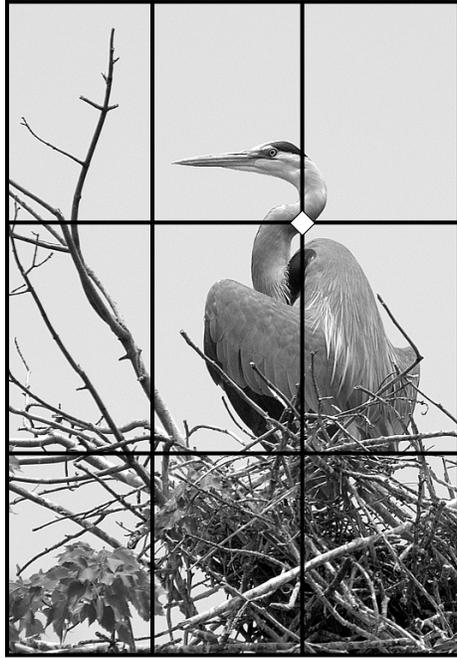
One of the most common compositional rules says that the horizon line should be level across the frame of a photograph, and not run across the vertical center of an image

Rule of Thirds



The “Rule of Thirds,” is one of the most important elements to good composition. You use the rule of thirds by dividing your image into nine equal parts. The rule suggests placing the subject on or near one of the four line intersection rather than the tendency of placing the primary subject right in the center of the image





Framing an Image



Framing uses foreground elements, like this barn door, to draw the viewer's eyes into the primary subject.



Leading Lines



The fence line draws the viewer's attentions to the main subject of the image.



The curve of the train and its track draws the eye to the steam engine – the primary subject in this image.

New Perspectives



A million photographs have been taken of poppies. The creative nature photographer, when faced with such a commonly photographed subject, should try to create something new and interesting. In this example the photographer shot from the underside, looking up, and the dew-covered stem makes it all that much more interesting.



Here again, photographing a common subject from a less-than-common perspective

The Influence of Natural Light

- Use the “magic light” of early morning and late afternoon
- Bright overcast day produces even lighting
- Avoid direct, bright sun as it creates harsh shadows



Many nature photographers will only take photographs early and late in the day – during the so-called hours of “magic” light. It’s at these times of day that the sun is at a low angle and the color of the light is warm.

Even though to many it seems counterintuitive, a bright overcast day often provides the best lighting for mid-day nature photography. Bright sunlight tends to create harsh shadows – something not generally viewed as a successful compositional element.



Back Lighting



Most people are taught to avoid shooting into the sun. While this can certainly be good advice – backlighting, where the camera is pointed toward the primary light source can be a powerful compositional tool. When a subject is backlit, it serves to diffuse or filter what would otherwise be harsh lighting.



Back Lighting



Back Lighting

Get Outside

Take Some Pictures and Have Fun



That's it... Now you have the tools you need to take great nature photos...



That's it... Now you have the tools you need to take great nature photos...



That's it... Now you have the tools you need to take great nature photos...



This feature

How to do great Nature Photograph with a Digital Camera

Was produced by the US Fish and Wildlife Service

Special thanks to Matt Poole, US Fish and Wildlife Service
Training Specialist, for his nature photography expertise

**How to do great Nature Photograph with a Digital Camera Was produced by the US
Fish and Wildlife Service**

**Special thanks to Matt Poole, US Fish and Wildlife Service Training
Specialist, for his nature photography expertise**