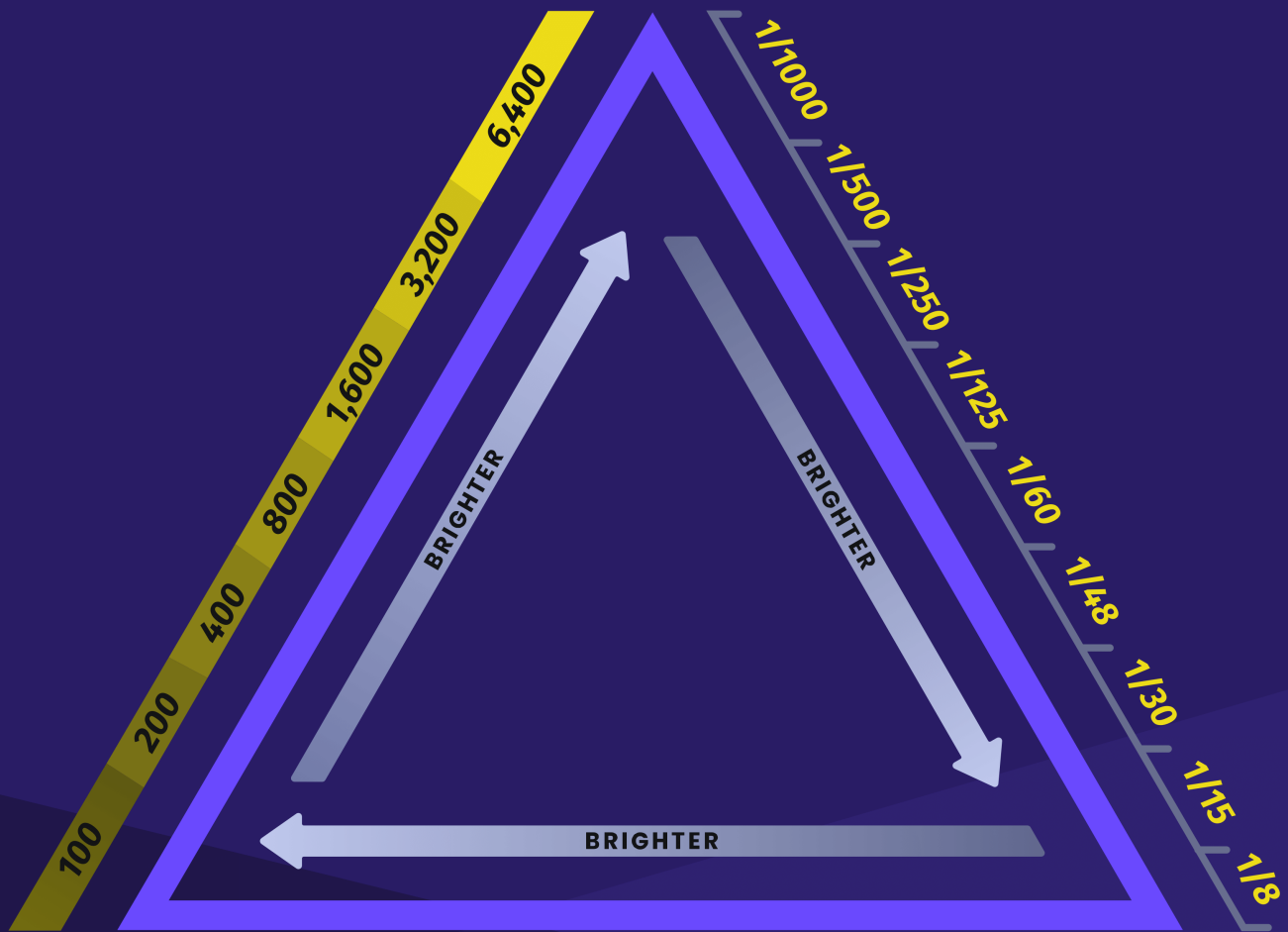


Exposure

THE ULTIMATE GUIDE



BROUGHT TO YOU BY

 studio binder

Exposure

THE ULTIMATE GUIDE

How to Shoot Striking Images Every Time

Brought to you by StudioBinder

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Foreword

The impetus behind StudioBinder was simple — to create a holistic [production management solution](#) that could handle everything from screenwriting and storyboards, to shooting schedules and call sheets.

But once this was done, it became clear that creating the software wasn't enough, we had to educate as well. Navigating the world of advertising, filmmaking, photography, music videos, etc. is a daunting task full of jargon, new technologies, and moving pieces.

The [StudioBinder Blog](#), which hosts over two thousand articles and millions of readers every month, and our [YouTube channel](#),

rapidly approaching 1 million subscribers, were born out of this goal to educate.

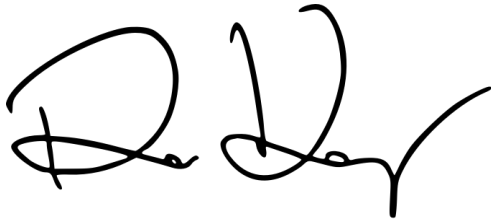
StudioBinder's business and educational aspirations have aligned in ways that I am continually inspired by. And it has been a true honor and joy to watch the StudioBinder community grow.

Which brings us to this latest resource: *Exposure – The Ultimate Guide*. Any image-maker understands that there are many considerations for every shot they take. Aperture, ISO and shutter speed can be complex topics on their own, and when you realize they're all interrelated it becomes much more so.

A single blog post can only do so much. We needed a resource that tackles all of these subjects holistically. This book aggregates materials on the various elements of the Exposure Triangle with with exercises on specific lighting scenarios and how to approach them.

We hope you get as much out of this ebook as we had putting it together. As you prepare for your next project, we hope this guide

will give you the opportunity to do your best work and create stunning (and well-exposed) images.

A handwritten signature in black ink, appearing to read 'R. Kiraz', with a stylized flourish at the end.

Robert Kiraz, CEO
StudioBinder



CHAPTER 1

Introduction



It's true — anyone can pick up any camera, snap a photo or press record, and images will be created. What separates the hobbyist from the professional is a desire to learn their medium inside and out. Photography and cinematography are "expressive" mediums. Like painting, poetry or music, image making is the pursuit of making the internal external; taking the image in your head and materializing it for the rest of us to see. Painters uses pigments, poets use words, musicians use notes, and photographers use light. The term “photography,” after all, comes from the Greek translation "drawing with light."

The first step in this process is to understand the mechanics of a camera and how they work in combination to produce imagery.

The focus of this book is exposure and how to manipulate light with the relationship between aperture, ISO and shutter speed. When you master these mechanisms, you can create a vast spectrum of images that communicate a powerful visual story.

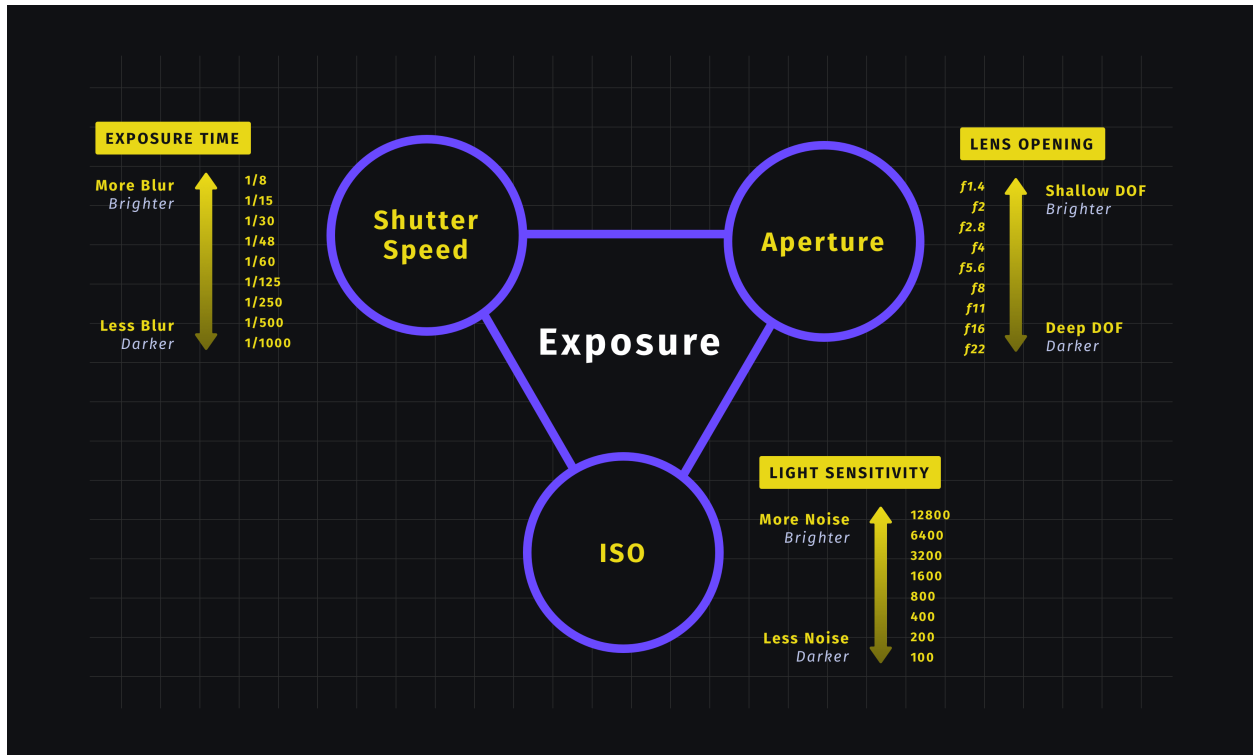
Let's get started.

CHAPTER 2

How the Exposure Triangle Works

Light is responsible for every image captured in both photography and cinematography. How a camera captures light is determined by three variables that make up what is known as the "exposure triangle."

The exposure triangle consists of three variables that adjust how a camera captures light: [aperture](#), [shutter speed](#), and [ISO](#). Together, these three elements properly expose a shot.



The Exposure Triangle

The three variables of the exposure triangle are all dependent on each other. For example, adjusting one of the three variables will entail an adjustment of another to maintain proper exposure. The exposure triangle is also referred to as the photography triangle and camera triangle.

Although aperture, shutter speed and ISO are the primary variables of the triangle that control exposure, each one also

affects other qualities of an image such depth of field, motion blur, and noise.

We'll begin by discussing each of the three components of the exposure triangle individually before demonstrating how they work together.

Our first stop: aperture.

CHAPTER 3

What is Aperture?

The road to properly exposing photos and videos start with aperture. While aperture is considered a camera setting, it's really a lens adjustment, and affects two critical components of capturing an image: light and depth of field.

Aperture is the opening of the lens through which light passes. A large (or open) aperture lets in *more* light that will hit the camera sensor, whereas a small (or closed) aperture lets in less light.

Aperture is calibrated in f/stops, written in numbers like f/1.4, 2f/, f/2.8, f/4, f/5.6, f/8, f/11, f/16, and on. The larger the number, the smaller the aperture. Think of the f/stop number as the radius between the rim and the hole. A higher f/stop like f/16 would measure all the space between the rim and the hole, and thus, a smaller aperture.

Think about the human eye. In a dark room, your pupils get bigger. Conversely, your pupils shrink when you're in a bright, well-lit space.



Aperture sizes

So remember:

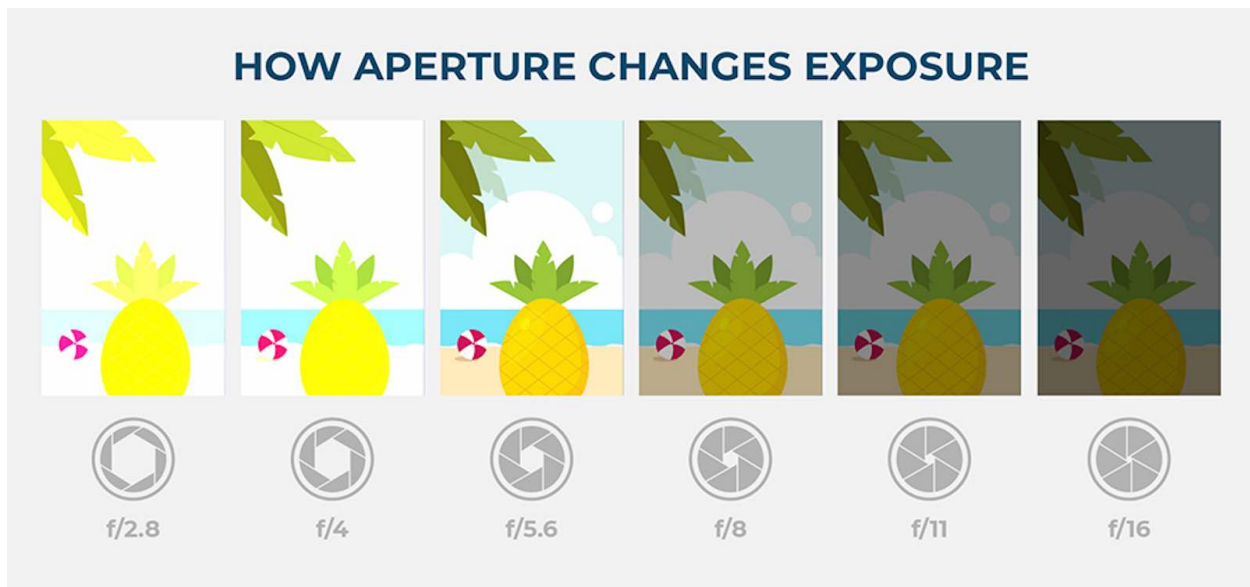
- ***Smaller*** apertures, like f/16, let in ***less light***.
- ***Larger*** apertures, like f/1.4, let in ***more light***.

Now let's talk about the visual differences in aperture sizes and how they can be applied to visual storytelling.

Aperture and Exposure

The size of the aperture will dictate how much light passes through your lens into your camera, and, thus, how exposed your shot will be. Naturally, the more light that comes through the lens, the brighter the image will be.

If you're in a room with a lot of natural light, a smaller, more closed aperture may suffice. It all depends on the scene luminance and brightness you desire.



How Aperture Affects Exposure

[Stanley Kubrick](#) famously used a lens developed by NASA to capture low-light scenes in [Barry Lyndon](#), a film lit only by candlelight. The f/stop on the NASA lens was a staggering 0.7 and produced gorgeous and soft images.



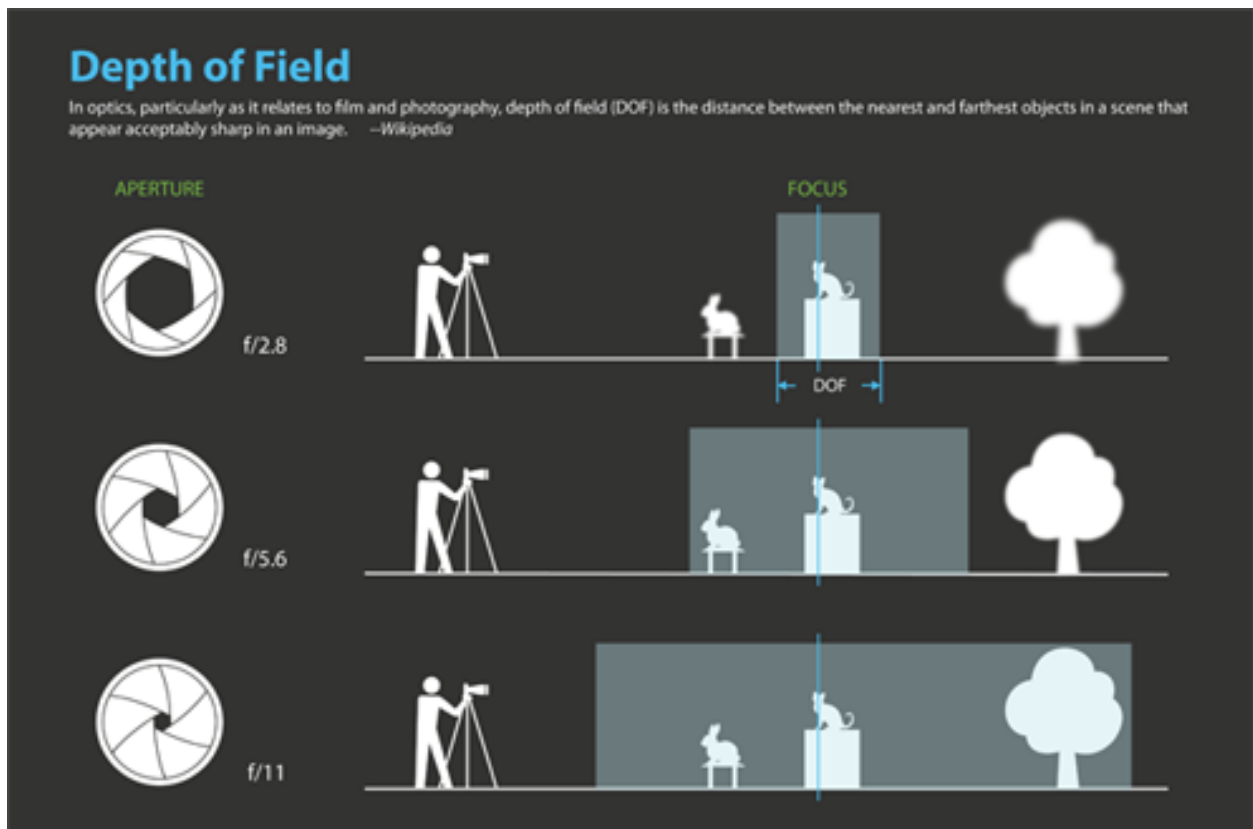
Barry Lyndon — Wide Aperture, Shallow Focus

Barry Lyndon shows us how camera aperture relates to exposure but this is just one part of how aperture affects an image.

Aperture and Depth of Field

Of course, light exposure isn't the only result of adjusting aperture. When you change your f/stop, you're also affecting the [depth of field](#).

Depth of field is the area of acceptable sharpness from foreground to background. Put simply, depth of field is how blurry or sharp the area is in front of or behind your subject.



Aperture + Depth of Field

The larger the aperture (lower f/stop) will provide for less depth of field and throw more of background out of focus. This is what's known as “shallow depth of field.”

A low f/stop creates larger foreground and background blur. This is popular for portraits, or when you want to isolate the subject. Remember this would be a small number like a f/1.8 or f/2.8.



Shallow depth of field

In film, there are many creative and valuable applications of shallow depth of field.

In the following scene from Spike Jonze's *Her*, the shallow focus keeps our focus on the characters.



Shallow Depth of Field — Her

But what if you want a deeper depth of field, aka a “deep focus?” This is where a larger f/stop comes in.

If you have a small aperture (a higher f/stop like a f/16 or f/22), the depth of field increases and more of the background will be in focus. In other words, by closing your aperture to let in less light, you can create a deeper focus. This is ideal if you're shooting wide landscapes. The image below would have to have been shot in a larger f/stop number like f/16 or f/22.



Deep Depth of Field

A deep focus can also provide for more staging opportunities along your z-axis. In this scene from *Atonement*, we have an example of a scene shot with deep depth of field. Not only is this one of the [best tracking shots](#) ever made, it's also a great example of how to use foreground, middle ground, and background in the same shot. Without the deep depth of field, we would not be able to capture the chaos and surreality of this situation.



Deep Depth of Field — Atonement

So remember:

- Small apertures like f/16 create a **deep depth of field**, allowing more to be in focus.
- Larger apertures like f/1.4 create a **shallow depth of field** allowing for a blurred background and foreground.

Now that you have more of a clear understanding of how aperture affects both the brightness *and* depth of an image, let's move on to the next part of the exposure triangle: ISO.

CHAPTER 4

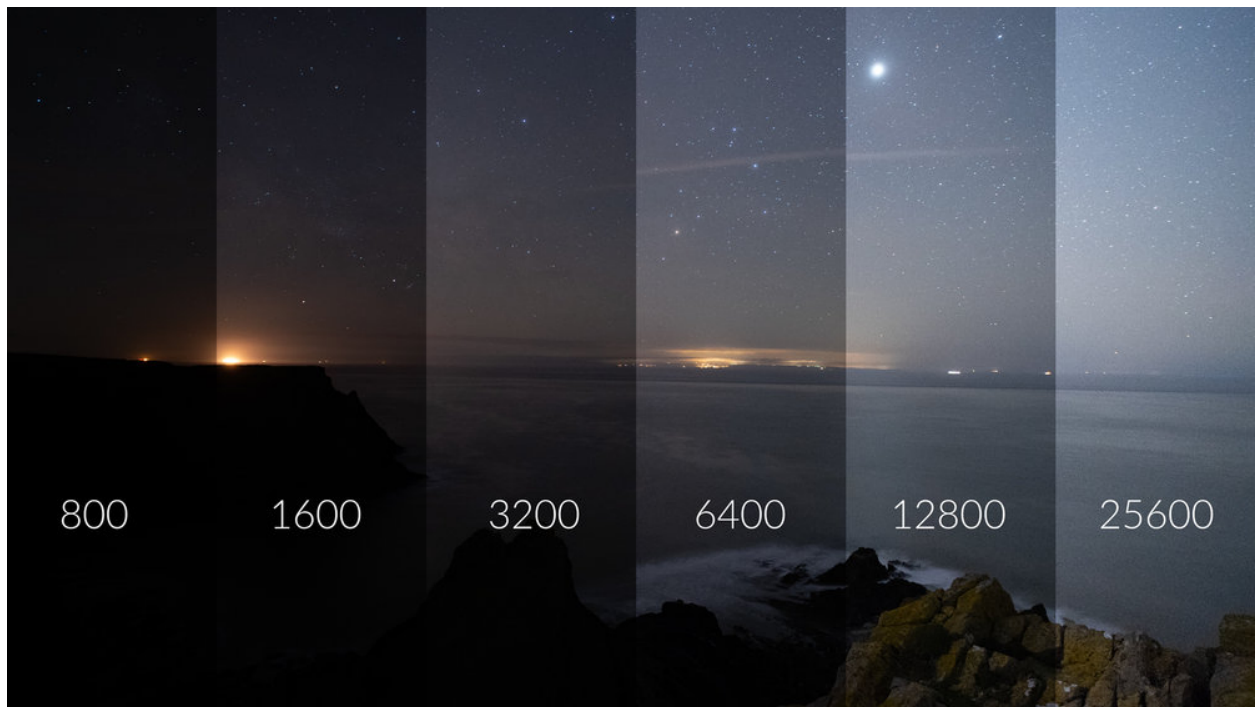
What is ISO?

ISO (eye-so, not eye-es-oh) derives from the Greek word “isos” which means “equal.” It was dubbed by the International Organization of Standardization, which creates international standards for everything from country codes to medical devices, as well as sensitivity ratings for camera sensors. But that's just trivia — it's better that we know what the ISO settings on a camera are, and what role they play when we capture a photo or video.

Simply put, ISO determines how sensitive a digital camera's sensor is to light. In a traditional film camera, ISO refers to a specific film stock's sensitivity to light. With new technology in

DSLR cameras, a camera's ISO setting, or its sensor's sensitivity to light, can be adjusted based on the available light of a shot.

ISO is measured in ISO values such as 50, 100, 200, 400, 800, 1600, 3200, etc. A lower ISO value such as 50 makes a camera's sensor *less* sensitive to light. A higher ISO value such as 6400 makes a camera's sensor *more* sensitive to light.



The dramatic effect of different ISO settings

ISO might sound like it is too good to be true when shooting with limited light. And that is because it *is*. Increasing your ISO may brighten up your shot, but it does come at a cost: image noise.

Say we're in a poorly-lit room and we have insufficient lighting, what do we do? As we learned in the previous chapter, the first thing we'd want to do is open our lens' aperture as much as possible to allow in the most amount of light. So let's say we do that, but the shot is still too dark.

So the next trick is raise the ISO, so the sensor becomes more sensitive to the light is coming in. Well, raising the ISO all the way up to 6400 or greater isn't necessarily a magic bullet. Although the image would be brighter, you'd start noticing more image noise and artifacts.

Sometimes this may be acceptable. If it's not, then you'll need to find a way to either introduce more light into the scene...

...or embrace the darkness.

Low Light Scenes

Cinematographers use darkness and shadows as much as they use light. Darkness can be incredibly important for a film's tone, story and theme. This may be the case when shooting at night...



Low light exterior — Jojo Rabbit

...out at sea...



Low light exterior — X:Men:First Class

...in the woods...



Low light exterior — Maleficent

...or in a tunnel.



Low light interior — 1917

The film *1917* spans various long takes to create an immersive 360 degree experience. This meant that cinematographer Roger Deakins had to light many of the darker scenes with practical lights visible on-screen while still retaining a deep focus.

In other words, Deakins had to contend with less lighting and a closed aperture. To pull this off, he needed a camera that could handle extremely low light situations: the ARRI ALEXA Mini LF.



Roger Deakins holding ARRI ALEXA Mini LF

Because of the camera's higher native ISO, Deakins could light minimally while closing his aperture to achieve a larger depth of field, all without introducing too much noise.

Noise and Grain

As we've touched on, increasing your ISO may help brighten up your shot, but if your ISO is set too high, your camera's sensor will become TOO sensitive, and it will display more noise.

Image noise is random variation in color information within an image. Noise causes textural and visual changes in a shot that, when present in large amounts, can appear low quality and unprofessional.

Some cinematographers have experimented with low amounts of image noise to imitate the effect of [film grain](#) which can add texture and energy to a shot. However, it's best to minimize noise and digital artifacts as it may distract the viewer.

How to Avoid Noise

As a general rule, to shoot an image with more clarity, higher color range, and less noise, you will want to keep your ISO as low as possible. A lower ISO will also maintain a wider dynamic range,

which measures the limits of how dark and light an image can be without losing detail.

So a larger dynamic range results in more detail and color range. Adjusting the ISO in either direction moves that range, sacrificing either the highs or lows in the process. If you want the most dynamic range, you'll want to shoot as close to as possible to what is known as a native ISO. Every digital camera has a native ISO value, specific to that camera. For instance, the ARRI Alexa Mini's native ISO is 800.



1917 — The Native ISO 800

Pro Tip: *If you're shooting a scene that travels between an exterior and in interior without cutting, it is vital to shoot as close as possible to a camera's native ISO to get the most dynamic range and highest detail in a shot.*

Digital Noise vs Stylistic Grain

Although many cinematographers strive for a polished image, some filmmakers take advantage of grain and noise because the texture can bring a unique quality to a shot.

Remember, there is a clear difference between grain and noise.

An image captured on a film strip produces film grain during the chemical “bath” it takes, when it's being converted. It's an organic process, and contributes an aesthetically pleasing texture that may add to the desired tone of the film.

“Grain” should be mistaken for “noise,” which is when ISO is pushed too far on a digital camera, producing less desirable

artifacts. In terms of digital cameras, noise is generally avoided because it can permanently destroy the clarity and dynamic range of an image.

Some filmmakers intentionally use a high ISO value to emphasize digital noise and manipulate it during post-production. This effect, especially when combined with post-production film grain effects, can result in an organic, analog style reminiscent of film.

Cinematographer Brandon Trost creates this effect in the film *The Disaster Artist*. Trost shot the movie at 3200 ISO, and added additional grain in post, purely for style.



In an interview, Trost explains:

“I like to shoot in low light, adding noise and increasing softness, which is something that helps me get that analog feel that’s so hard to emulate with digital cameras. I shot this movie at 3200 ISO, and I added some film grain in the color grade as well, to kind of mellow out the sensor noise and add some more of that analog flair.”

Whether you want to achieve an analog aesthetic or imbue a shot with movement, noise doesn't always have to be avoided. It can also be a tool to serve a film’s story.

This concludes ISO. We now move on to the final element in the exposure triangle:

Shutter Speed.

CHAPTER 5

What is Shutter Speed?

A camera takes a photo by exposing film or a digital sensor to light. The camera shutter acts like a barrier; it stays closed to keep the light out when you're not taking a picture.

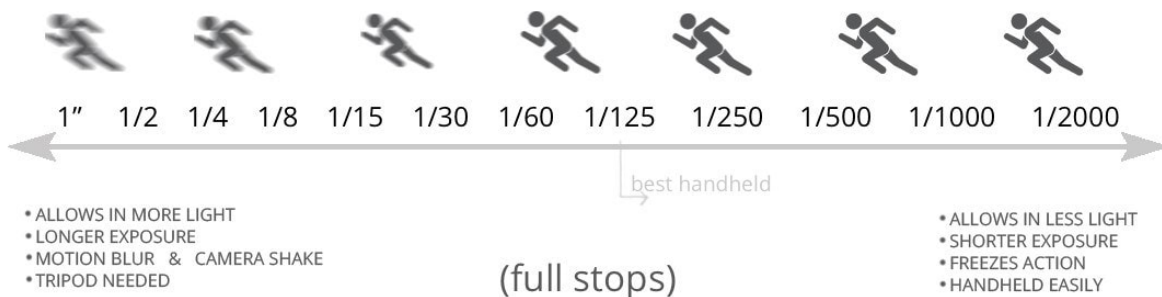
When you take a photo (or video which is simply a series of photos), the shutter opens to capture the photo, and closes again when finished. This interval — the *speed* of this shutter — has a major effect on the final visual, and it's the subject of this chapter.

Shutter speed controls how long the sensor of the camera is exposed to light, measured in fractions of a second. For example, a shutter speed of 1/60 holds the shutter open for one sixtieth of one second.

The longer the shutter speed is in time the more light is allowed to travel in. If it is shorter in time, less light is let in.

Like all the other elements of the exposure triangle, shutter speed not only affects exposure, but other visual elements as well — largely motion blur.

SHUTTER SPEED

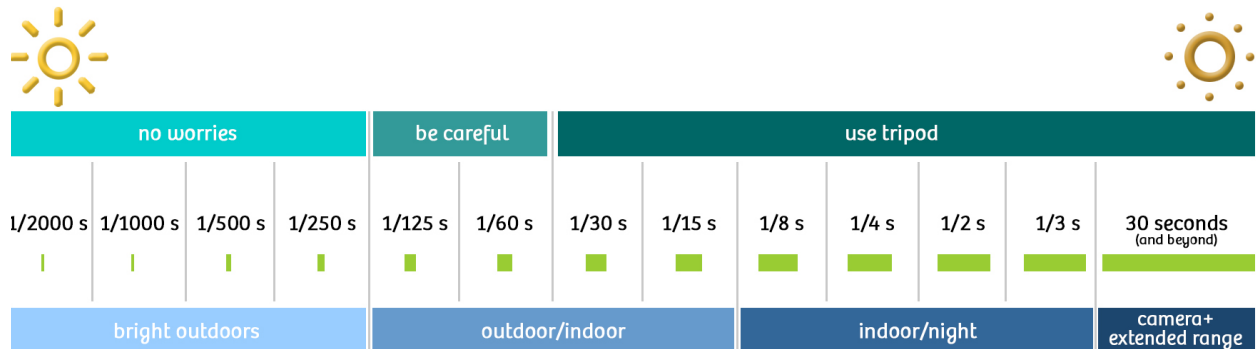


How Shutter Speed Works

When shooting with limited light, you may think it would be a good idea to adjust your shutter speed to let in light longer. So you set it at a 1/20.

The downside of a longer shutter speed like 1/20, is that motion blur becomes much more prominent when you are either capturing a moving subject or the camera itself is moving.

SHUTTER SPEED



Shutter Speed Chart

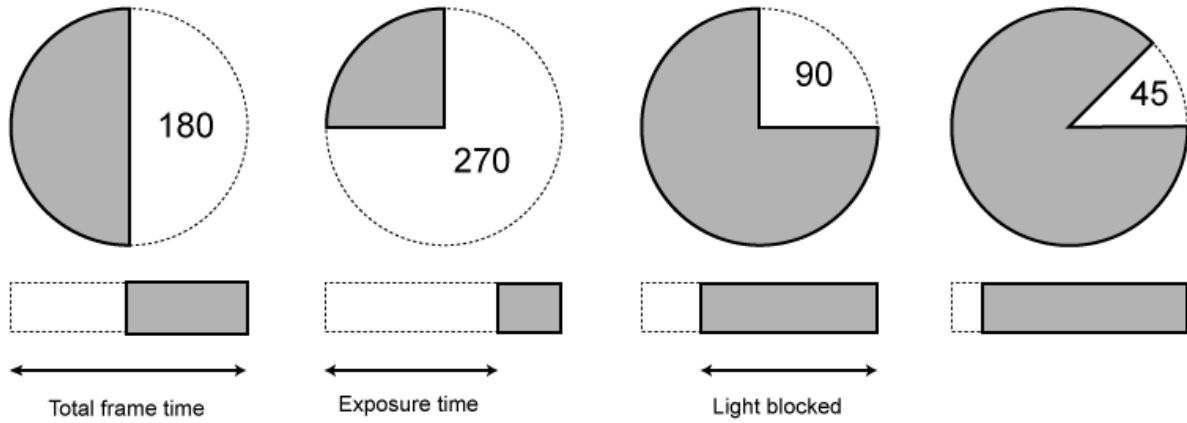
On the opposite end of shutter speeds, fast shutter speeds like 1/1000, will be crisp, but it will also let in less light making it not very ideal for darker shots.

This effect also applies when shooting video. Most mirrorless and DSLR cameras have a large range of shutter speeds. It usually depends on the quality of the camera. Most DSLRs can go from 1/4000th to 30 seconds. While some can climb to 1/8000th, depending on the model. This is just one of the differences between [DSLRs and mirrorless cameras](#).

What are Shutter Angles?

When it comes to cinematography and shutter speed, shutter angles and the 180-degree rule will help you achieve a cinematic look. So, what are shutter angles?

Shutter angles provide a way to describe the relationship between [frame rate](#) and shutter speed. It uses the concept of rotary shutters to illustrate how light passes through an angled opening once per revolution. Digital cameras don't use rotary shutters but the following diagram helps to illustrate the concept.



Shutter Angles and Exposure Time

Larger angles equal more light passing through. This translates to slower shutters and more motion blur. Take a look at this example from *Saving Private Ryan* that utilizes a slower shutter speed for choppy, jittery shots.



Saving Private Ryan — High shutter speed and motion blur

Although modern digital cameras' shutter speeds do not operate this way, shutter angles are still a primary means of describing motion blur in an image and how it correlates to frame rate.

For The Cinematic Look

Standard	Shutter Speed
23.986	48
24	48
25	50
30	60
Slow Mo (to be reverted to 24fps)	
60	120
100	200
120	240
200	400

Frame Rates and Shutter Speed

A cinematic shutter speed captures motion in a way that is most natural to the human eye. For example, if you are shooting at a frame rate of 30 fps, the cinematic shutter speed to shoot at would be 1/60.

Once light passes through the aperture for a specific amount of time determined by the shutter speed, it finally lands on the [camera's sensor](#) in a digital camera.

The 180-Degree Shutter Rule

There's something called the 180° Shutter Rule. The rule explains the relationship between shutter speed and frame rate. [Frame rate](#) (frames per second or FPS) is the frame at which consecutive images called frames appear on a display. Let's define the rule and see how shutter speed and frame rate work together, particularly with video.

The 180-degree rule states that your shutter speed should generally be set to double your frame rate. This is a film industry standard and is sometimes referred to as "cinematic shutter speeds."

Most DSLR's have the option to shoot at 1/50th but not 1/48th, so if you're shooting at 24 frames per second, it's best to set the shutter speed to 1/50th.

Adjusting the shutter angle is a way to "break" the 180° rule. Remember, this is not to be confused with [the 180° rule](#) related to staging your scene.

If you have a wide shutter angle, anywhere from 270° to 360°, your shot will appear shaky, and will have greater motion blur. This could be useful for creative purposes depending on the narrative or story you're trying to tell.

Of course, the opposite is true — shooting with a narrower shutter angle, the less motion blur from frame to frame.

To recap, a higher shutter speed will give your footage a slightly unnatural look, and sometimes that's what you want. To approximate human vision, keep your shutter speed at 1/50th of a second.

Now that we've covered the essential elements of the exposure triangle, let's put this knowledge to practice. We'll explore a little deeper with some real world scenarios and how to handle various exposures.

CHAPTER 6

How to Avoid Over and Underexposure

Knowing how to properly expose your shots is an obvious first step for becoming a photographer or cinematographer. But we'll also take a look at why overexposing or underexposing photos with intention sometimes works (and sometimes doesn't).

Overexposure is when an image appears brighter than it should, or brighter than neutral exposure. When too much light hits the camera's sensor, it results in an extremely bright image that is

over-exposed. Overexposure limits detail in the photo and reduces distinguishable highlights for correction in post-production.

Underexposure is when an image appears darker than it should, or darker than neutral exposure. An underexposed image is the result of not enough light hitting the camera's sensor. Underexposed images often lack detail and the objects or subjects can even blend together in the shadows of the image.

Quite often, you can tell with the naked-eye when an image is overexposed, underexposed, or just right.



Before we get into these various techniques to get “correct” exposure, let's look at two examples that broke the rules for narrative effect. First, an example of overexposure.



Overexposure — Slumdog Millionaire

How do we know it's overexposed? For starters, it's noticeably brighter than it normally would be. The brightness overpowers distinguishing details like facial features, wardrobe, and environment. Because it's over-exposed, the shadows are

muddied, and there are blobs of light all over the image. The end result: the visual is nostalgic. Like a distant, hazy memory. Although the rules of exposure were broken by director Danny Boyle, it was done so intentionally to underscore the narrative purpose of the scene.

Underexposed is simply the opposite of overexposed, where the image appears too dark. Highlights are muddied while mid-tones and dark-tones are crushed towards black. In the following shot, it's nearly impossible to make out the subjects' expressions, or the terrain. As a result, a mysterious beguiling effect is generated the viewer as they lean in to take in the shadowy and potentially nefarious moment. Again, the rules are broken with intention.



Underexposure — Inherent Vice

Although exposure rules can be broken at times for effect, they are generally followed. To reduce that possibility of overexposure or underexposure, the photographer must be able to control the amount of light that gets into the camera using lighting and the elements of the exposure triangle. Obtaining proper exposure is ideally done in the field, but there are ways to adjust exposure during post-production.

Using Incorrect Exposure Creatively

Many photographers and cinematographers treat exposure in very concrete "good vs bad" terms. "Correct" exposure just means that it matches the actual lighting conditions. But there are many reasons why you'd want to use overexposure or underexposure in your work for creative or stylistic purposes.

In *Close Encounters of the Third Kind*, director Steven Spielberg uses blindingly bright spaceship lights to completely blow out the highlights into pure white. Narratively, overexposure in this moment makes sense! It fits the scene but also creates tension.



Close Encounters of the Third Kind

It also works well in dream sequences like in *Run Lola Run...*



Overexposure in Run Lola Run

Other instances when overexposure could work would be characters “seeing the light,” some representations of Heaven, the afterlife, ghosts and paranormal beings.



Overexposure in Harry Potter and the Deathly Hallows Part 2

Underexposure can be used creatively as well, but proceed with caution. Underexposing *people* in a frame, versus objects and terrains, can be frustrating for viewers, mainly because when people are on screen, we want to see their expressions and what they're doing. Straining to understand what is going on can be a frustrating experience.



Underexposed film: Can't see features of our characters

Of course, there are always times when this makes sense. Whether to increase tension or convey a particular feeling, underexposing images can be a powerful technique. Immediately, horror genres and suspenseful scenes come to mind. If you want the audience to wonder what could be lurking in the shadows, you should probably create some shadows...



Us: underexposure to elicit fear

Photographers and cinematographers have the unique ability to truly control what a viewer sees. Controlling the light means you can control the picture, it's feeling, tone, and ultimate effect.

So, now that we know rules can be broken with “incorrect” exposures, how do we shoot “correct exposure” in the field?

Let's walk through each of these methods individually.

CHAPTER 7

How to Get Correct Exposure Every Time

You don't need to have production lights or be a lighting expert to take perfectly exposed shots. All you really need is a clear understanding of how light works in-camera.

The first and most obvious method to get correct exposure is to make your adjustments to the exposure triangle in the field.

Let's begin with method 1, which begins and ends with the exposure triangle.

METHOD #1: ADJUST CAMERA SETTINGS

By now, you understand how the exposure triangle works so when you find yourself overexposing or underexposing your shots, it's time to start changing those settings. It's best to proceed in the following order:

Step 1 — Set Shutter Speed: According to the 180° Shutter Rule (see chapter 5), your shutter speed will be set to roughly double your frame rate. This means at the commonly used 24fps, your shutter should be set to 1/50.

Step 2 — Adjust Aperture: Set your aperture to the f/stop that you want *artistically*. Remember, aperture controls the amount of light that enters the camera, affecting both the brightness and depth of field of the image. Larger (more open) apertures like f/1.4 allow in more light, but they result in a shallower focus. The opposite is also true with a smaller (more closed) apertures like f/22; less light, but you get a deeper depth of field.

Step 3 — Fine-Tune ISO: Since shutter and aperture are locked in at this point, the ISO becomes your variable to

control the exposure. In an ideal world, the ISO would be set as close as possible to your camera's native ISO for the best dynamic range and most noise-free image.

- ➔ If your ISO is all the way down, but the image is still too bright, use an ND filter to lessen the light.
- ➔ If your ISO is raised all the way up, but the image is still too dark, or so noisy that you need to drop your ISO back down, you'll need to return to your aperture and open it up further to let in more light. If your aperture is already wide open, you will need to either add more light, or experiment with the ISO that provides the least trade-off in quality.

METHOD #2: USE A LIGHT METER

A light meter is a handheld sensor that measures the light hitting a subject. The most advanced light meters will tell you the proper settings for aperture, ISO and shutter speed. All you have to do is

hold up the light meter near your subject, take a reading, and then enter those settings on your camera for proper exposure.



DP Roger Deakins using a light meter

However, it's important that you become comfortable adjusting your camera settings without an over-dependence on a light meter. As Academy Award-winning cinematographer Roger Deakins says, “The idea of going around the set and taking a reading of every little dark light and every variation—you

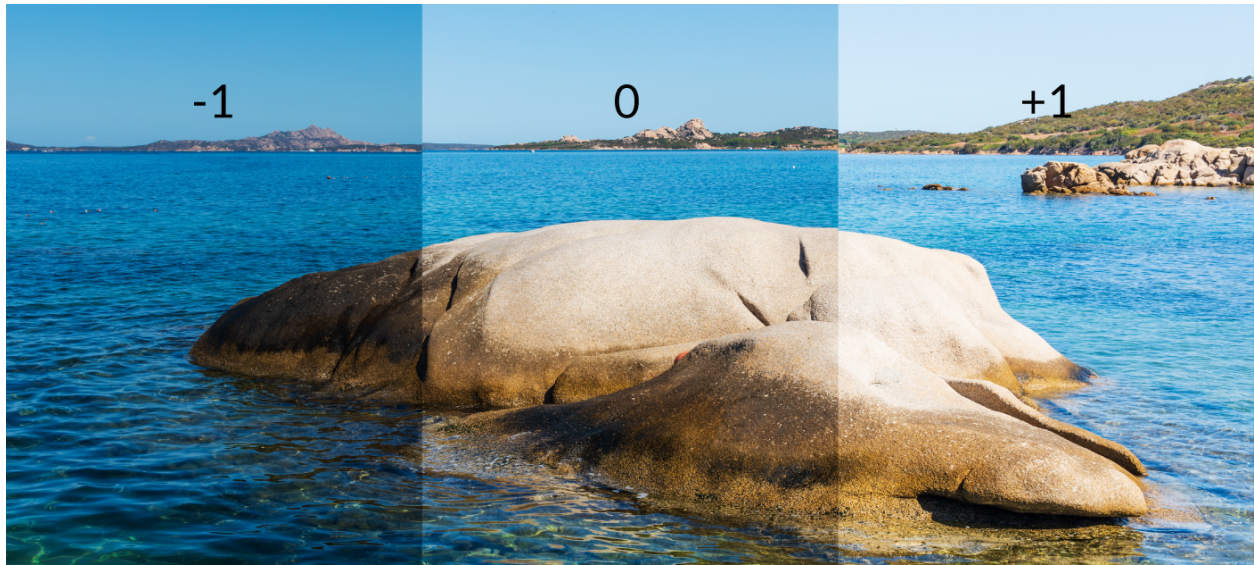
shouldn't be a slave to the meter. I take one reading of the scene [with a meter], and then I can judge exposure by eye after that.”

METHOD #3: BRACKETING

This method is an exposure technique for still photography. Bracketing is the process of shooting the same image, shot, or scene multiple times using different camera settings resulting in different exposures.

Bracketing can also be used to merge photos of the same image with different exposures during post. Sometimes this is the only way to capture the image you have in mind.

Tip: *If you're using the bracketing technique be sure to utilize a tripod. This ensures that your shots are identical frame to frame, and will help when merging photos in either Lightroom or Photoshop.*



Exposure bracketing

Most photo cameras have a function called AEB or “Automatic Exposure Bracketing.” In this camera bracketing mode you can take multiple photos with only one click of the shutter. This auto bracketing function makes the process much easier.

METHOD #4: EXPOSURE IN POST

The final method to get proper exposure is to use various editing programs like Lightroom, Photoshop, or Premiere. Here are some detailed and technical ways to adjust your exposure.

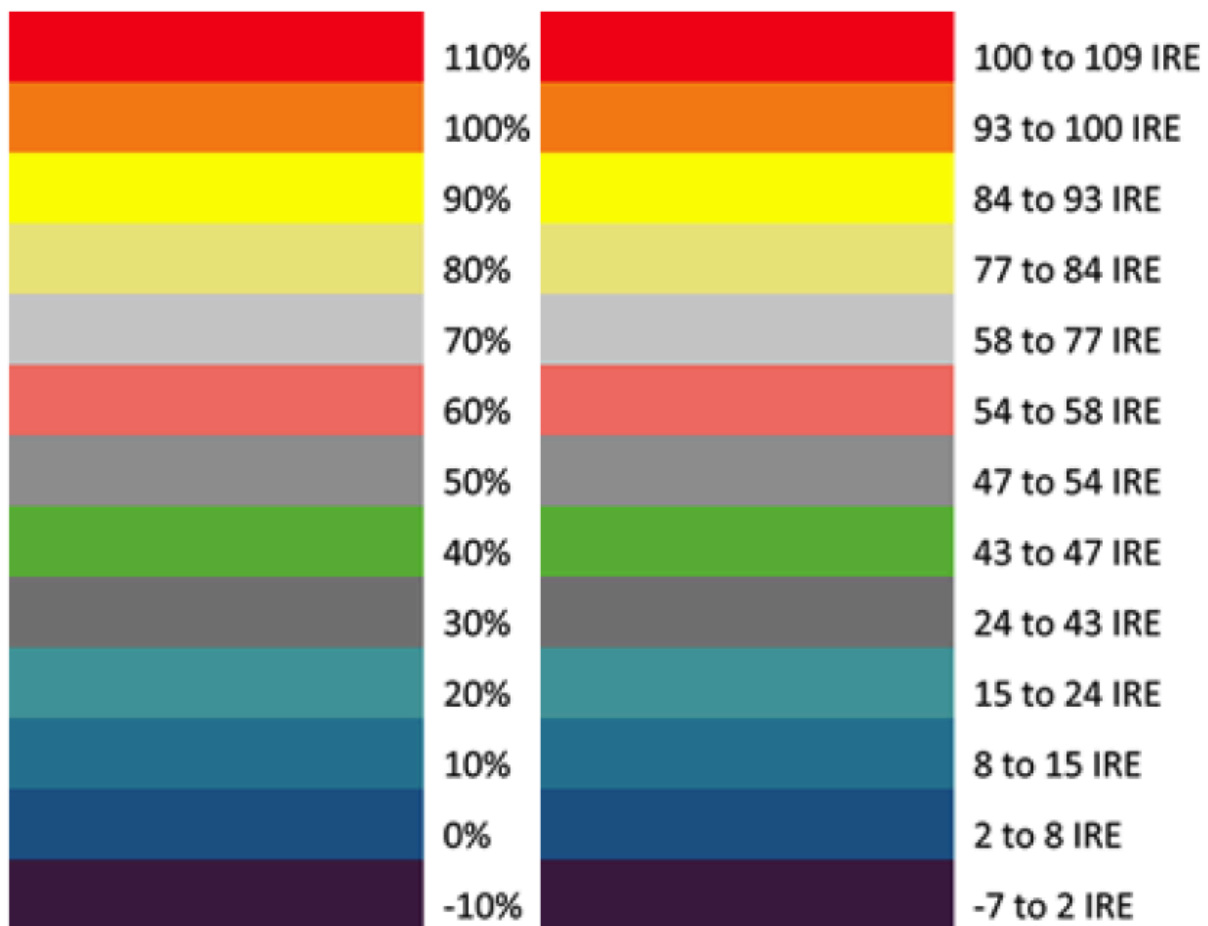
False color is a feature on monitors that can read exposure levels in a given shot. It is primarily known for displaying images in a different color scheme to make certain details more noticeable.

Images displayed with false colors follow a spectrum that includes purple, blue, black, grey, yellow, orange, and red. These colors can help you figure out how much false color exposure your image or shot is receiving.



Using False Color in Exposure

The first thing you want to familiarize yourself with are IRE levels. IRE is a unit to measure composite video signals; the acronym comes from the Institute of Radio Engineers. In the context of false color levels, you will see them on the monitor represented by a color spectrum.



False color chart

Purple (IRE 0) represents no color whatsoever, aka black. Blue and blue variations (IRE 2-24) mean that what's there is very dark and not getting much false color exposure. Dark grey (IRE 24-42) signifies you're leaving (or entering) an area that is underexposed.

Once you hit green (IRE 43-47), you're reaching light grey (IRE 47-77), which is usually the best false color for human skin tone (usually IRE 70). But then you start entering overexposed territory with yellow (IRE 78-93), which is followed by orange (IRE 93-100), before ending with red (IRE 100+).

Avoiding overexposed skin tones is something you can use false color for, since you can use the IRE guide to figure out whether you've got a match (IRE 70, aka light grey). Or maybe you want to cover that face in darkness; you can make sure some of the face is still visible (IRE 70) but that it's surrounded by darkness (IRE 10-20).

CONCLUSION

There are multiple methods to ensure your exposure is set correctly. You can obtain proper exposure by:

- Adjusting shutter speed, aperture, and ISO (in roughly this order)
- Checking exposure with a light meter
- Photo bracketing and compositing in post (for still photos)
- Adjusting exposure in post-production

CHAPTER 8

Adjusting Exposure in Post-Production

First things first. Learn how to take a properly exposed photo in the field. No matter how well you know how to use programs like Lightroom or similar, having a strong understanding of how the exposure triangle works, eliminates the need to “fix it in post.”

But nobody's perfect and sometimes knowing how to fix incorrect exposure in programs like Photoshop, Lightroom, Premiere or Final Cut Pro is essential.

EXPOSURE SLIDER

The Exposure slider adjusts the overall brightness of your image. The numbers on these are the number of stops you can increase or decrease. Remember that this affects your entire image, so go slow. It's a good place to start but isn't best for those final details. More local details or exposure changes, you can use the Adjustment Mask.

WHITES AND HIGHLIGHTS SLIDERS

The Whites slider adjusts the mid-tones in your image. The mid-tones hold a ton of contrast. Be careful not to go too far, as you can remove the majority of detail from a lit area.

Highlight sliders adjust the brightest areas of your photos and can help remedy any details you need to pull out.

SHADOW SLIDER

Like the Highlight slider, this one boosts underexposed areas of your images well. It can bring structure back. Pull this to the right.

If these adjustments aren't enough to remedy the issue, try Lightroom's other tools.

You can use a brush or radial filter to brighten your subject without touching the background. Gradient filters brighten a dark foreground without overexposing the background or sky.

But if you don't have Lightroom, no worries. You can do similarly cool fixes in Photoshop.

Editing in Photoshop

First, duplicate your background layer. Similarly to Lightroom, find your Shadows and Highlights sliders. Adjust to the right accordingly.

If you need more contrast to the photo, or need more brightness still, you can add a *curve adjustment layer* in order to draw out the highlights of your shot.

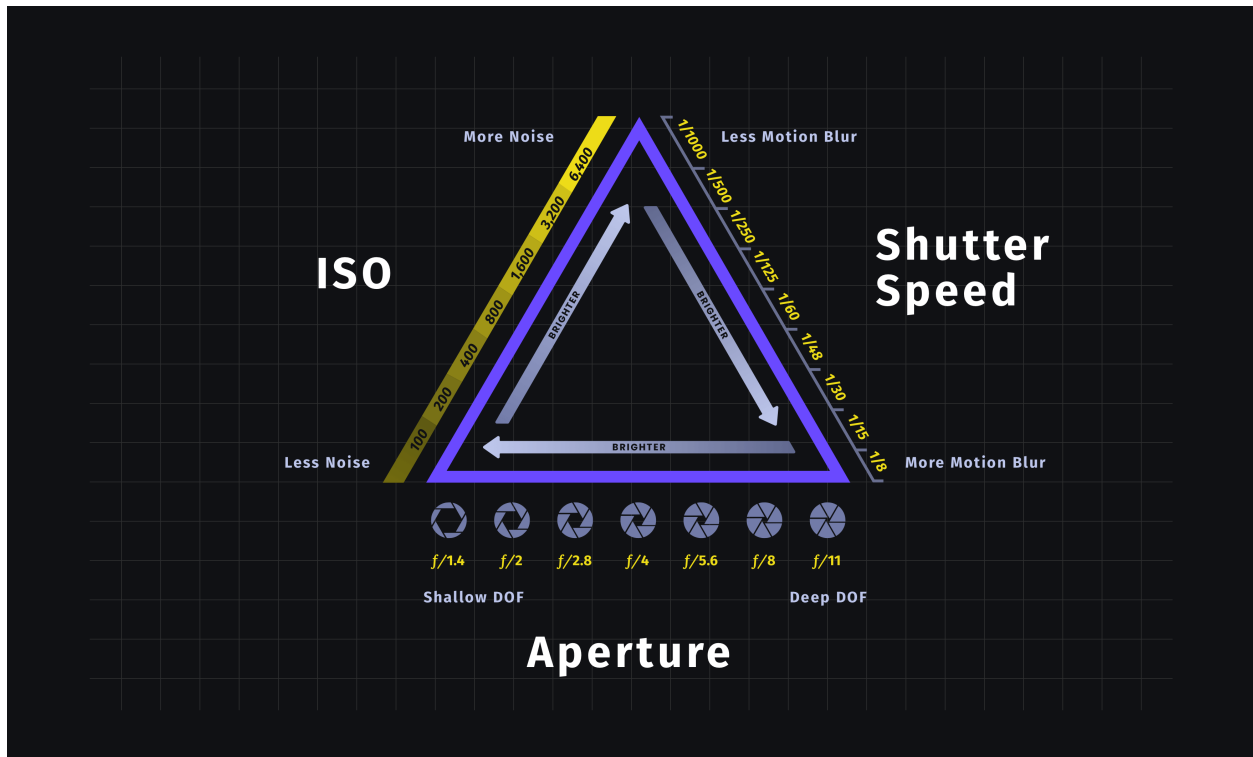
Go to Layer > New Adjust Layer > Curves. You can then drag the curve up to your desire. If you invert your layer mask and paint white with your brush tool, you can see the skin tone gets lighter. But you might not want everything brightened at the same time here. You'll likely just want to brighten the highlights so it looks more natural.

If you go back into your curves adjustment layer and find the slider for Underlying Layer. Click alt or option to drag the darker slider to the right. This will add a little more brightness to your highlights.

Exposure Exercise #1: Low Light Scenarios

On the other side of the lighting spectrum, is shooting with a limited amount of light. This could be the case when shooting at night, within closed interior locations, or shooting without much lighting equipment.

You'll need to find a balance of all three exposure variables to properly expose your shot while also achieving the visual look you desire. The following exposure triangle diagram is a great reference to use when determining what settings will allow more light in and what side effects it would entail.



The Exposure Triangle

Let's take a look at an example of a low light shot from the film *1917*. In this scene, the only source of light is coming from the flashlight practicals. Reference the exposure triangle above to find to properly expose the shot while maintaining the image's quality.



Exposing in low light — 1917

SHUTTER SPEED

Since *1917* is a feature film at the usual 24 fps, we know the shutter speed would be set at 1/48th (or 1/50th) of a second.

APERTURE

To let in the most amount of light possible, the aperture should be as wide as possible. But in an interview, cinematographer Roger Deakins said he wanted to have a bit of depth. To let in as much

light as possible with a bit of depth, the aperture would be set at something like an f/2.8, f/4, or even an f/5.6.

ISO

1917 was shot on an ARRI ALEXA Mini LF. With a bit of research we can find the native ISO of this camera sits comfortably at 800. Deakins said that he could push the Mini LF's ISO to 1,600 without the risk of noise.

TAKEAWAY

Finding a balance between all three in a low-light setting will depend heavily on what you want to capture. For example, if you want to shoot a video with a shallow depth of field, opening up to a f/1.4 or f/2 may be enough to properly expose your shot. But if you want a deeper depth of field achieved by an f/5.6, you may need to increase your ISO to compensate for the low light.

CHAPTER 11

Exposure Exercise #2: Bright Light Scenarios

There are pros and cons when shooting in an environment with a lot of light, such as a midday exterior shot. The benefit would be that you can shoot at your camera's native ISO (or lower) to allow for minimal image noise and a robust dynamic range.

However to avoid overexposing your shot, you'll want to adjust your aperture first and foremost. If you are shooting a still photo, you may want to begin with shooting at a faster shutter speed to cut down the amount of light coming into the camera. This will

allow you to control the light without compromising your desired aperture and depth of field.

If you are shooting video in a bright setting, you won't have the luxury of adjusting your shutter speed as we learned in chapter 5 (see 180-Degree Shutter Rule). In other words, the shutter speed of a 24 fps video would be locked at 1/50.

If the image is overexposed, start closing down your aperture to something larger like f/16. While this will affect your depth of field (deeper plane of focus), it will at least cut down on the light that is entering the lens.

Let's take a look at this scene from *No Country for Old Men*. The scene is an exterior location with harsh, midday desert sunlight.



Exposing in bright light — No Country for Old Men

Let's consider what the different variables of the exposure triangle might have been set to in this scene.

SHUTTER SPEED

To maintain a cinematic shutter speed when shooting at 24 fps, the shutter speed would be set to either $1/48$ or $1/50$.

APERTURE

The aperture of this scene would need to be as small as possible to cut down the amount of light let in. The depth of field is also deep. Shooting at about an f/16 or f/22 seems likely.

ISO

To determine the ISO of this brightly lit shot, we would look at what the native ISO of the camera is. *No Country for Old Men* was shot on an ARRICAM Lite with a native ISO of 500. The ISO would be set at 500 or less. Given the harsh sunlight, if the shot were still overexposed, an ND filter would have been utilized to cut down light without adjusting the aperture. This will also allow the cinematographer to shoot at a wider aperture (or a shallower depth of field) without overexposing.

CHAPTER 12

Exposure Exercise #3: Capturing Motion

The exposure triangle's primary function is to properly expose an image. But how does it hold up when considering motion? Different variables of the exposure triangle can impact how motion appears in a shot. When capturing images with quick, fast movements a higher shutter speed is typically better.

In still life photography, capturing a bird flying in the sky will appear too blurry with a slower shutter speed. A faster shutter

speed of around 1/500th of a second to 1/1000, will be able to capture the bird mid-action with full clarity and sharpness.

When shooting video, fast-moving action would also benefit from a fast shutter speed. Sporting events, action scenes, or a live concert entail quick movements. If captured with a slow shutter speed, these movements may appear blurry or even out of focus.

Take a look at this scene from *John Wick 3*. The fight scene is not blurry. But crisp and clear. A fast shutter speed will capture the movement sharply.



Exposing for movement — John Wick Chapter 3

SHUTTER SPEED

Although you should follow the 180-degree shutter rule, there are times to bend it. Shooting an action scene is one of them. Cranking up your shutter speed in this scene to about 1/125th of a second makes movements more crisp, snappy and intense with minimal motion blur.

APERTURE

Since the shutter speed is increased, the amount of light that hits the sensor is decreased. To balance this out and properly expose the shot, the aperture would open up more than usual. It's likely that the scene was shot with a larger aperture, say an f/2.8, to allow in more light while maintaining some depth.

ISO

The ISO will depend on the native ISO of the camera used, and the amount of set lighting. However, there is a decent amount of light in the shot and the ISO will probably not need to be increased from around an ISO 500.

TAKEAWAY

Keep in mind that a faster shutter speed will cut light, and thus require adjustments of other exposure variables and set lighting to compensate.

Mastering the exposure triangle is a fundamental skill necessary for every photographer and cinematographer. While it may seem incredibly technical, it is what allows the [best cinematographers](#) and photographers to capture the creative images that they envision.

Reading and understanding the different variables of the exposure triangle is just part of the battle of mastering exposure. The second part is getting out and experimenting with the different functions of your camera. Spending time shooting is just as important as the research you put in.

Now get out and get shooting!

CHAPTER 13

Conclusion

The ultimate goal of any image maker is to capture the vision in their head. To do so, photographers and cinematographers need to understand the tools of their medium and how even the slightest adjustments can mean a world of difference.

Exposure is a core principal in the search for the perfect visual, and the exposure triangle is the map to get you there. Once you internalize the symbiotic relationship between aperture, ISO, and shutter speed, you'll be able to adapt to any lighting scenario.

Our hope is that this ebook has provided a foundation that can be built upon and expanded as you set off on your image-making journey.

MORE RESOURCES

Now that you've finished reading this guide, don't stop there! You've established the principles of exposure, and learned what it takes to create an iconic look and feel in your project. Your download of this ebook comes with the image samples for easy viewing and printing.

If you're craving more more resources on filmmaking, film theory and production how-to's, visit the [StudioBinder Blog](#).

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As a bonus for reading this ebook, we want to offer you a special discount off StudioBinder.

[StudioBinder](#) provides a cloud-based, all-in-one production management solution to help production teams better collaborate, create shot lists, storyboards, shooting schedules, script breakdowns, call sheets and more.

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