Funded by
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GUIDE OF

VIDEOMAKING

AS A TOOL FOR YOUTH EMPLOYABILITY

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Introduction

The “Guide of videomaking as a tool for youth employability” was developed as a result of Erasmus+ Mobility of youth workers “Shoot for the Future” ref. nr.: 2023-3-LT02-KA153-YOU-000184291 Training course that took place in 2024 in Lithuania with a great input from all the participating youth workers from Lithuania, Estonia, Poland, Slovakia, Hungary, France, Croatia and Romania. The participants completed the training course equipped with the essential tools to empower their proteges in achieving the maximised results in their job search, in turn making them better youth workers for future generations. The goal of the project was to develop knowledge, abilities and attitudes of 32 youth workers from 8 non-profit organizations from Lithuania, Estonia, Poland, Slovakia, Hungary, France, Croatia and Romania on videomaking to empower young people to increase their employability. During the project we successfully reached the following objectives: increased the level of knowledge, abilities and positive attitudes of the participating youth workers in engaging youth in videomaking to facilitate the access of youths to

labor market, as well as increased the capacities of the 8 partner organisations in organizing events, activities and workshops for youths on the topic of videomaking that can higher their chances to access the labor market.

We would like to thank our participants for making this project such a success!

Asociacija “Keliauk pirmyn”, Lithuania

Dynamic range

What is Dynamic range?

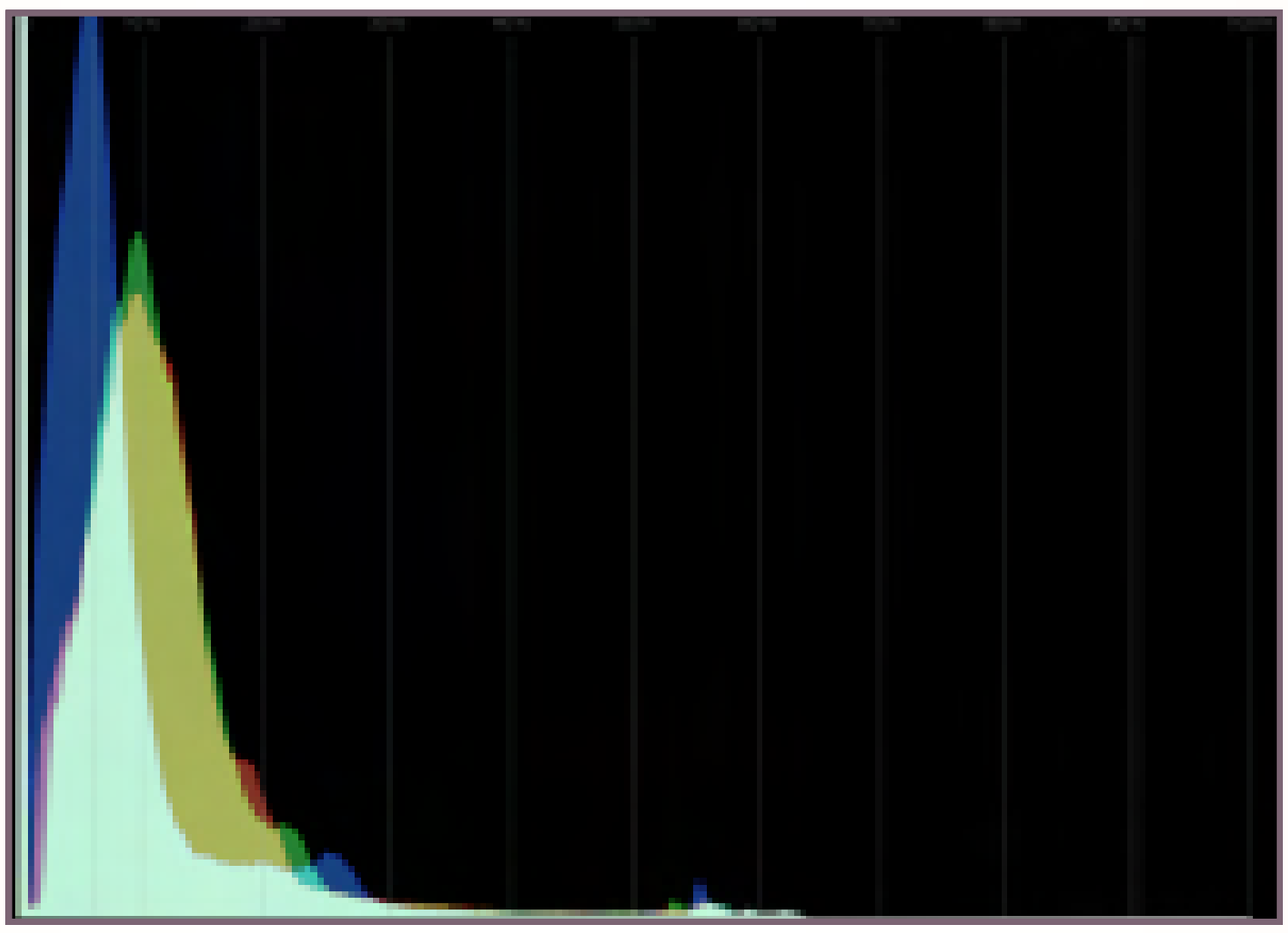
Dynamic range is the measurement between the maximum and the minimum values that can be perceived in an image or video. Which means that the greater the difference between the deepest blacks and the brightest whites, the larger the dynamic range. Let us give you an example: Imagine that you have three rulers with different scale accuracy, meters, centimeters, millimeters and an object 382 mm long that needs to be measured exactly. The different rulers represents a camera, the object represents light and the dynamic range is accuracy of the rulers. If we use the meter ruler we may notice that the object is smaller than 1 meter, but we can't tell how small, meaning our picture doesn't have enough details to distinguish what's in the image.

If we use the centimeter ruler we can measure the object more precisely and determine it is about 38cm, so we would be able to see the important details in the picture.

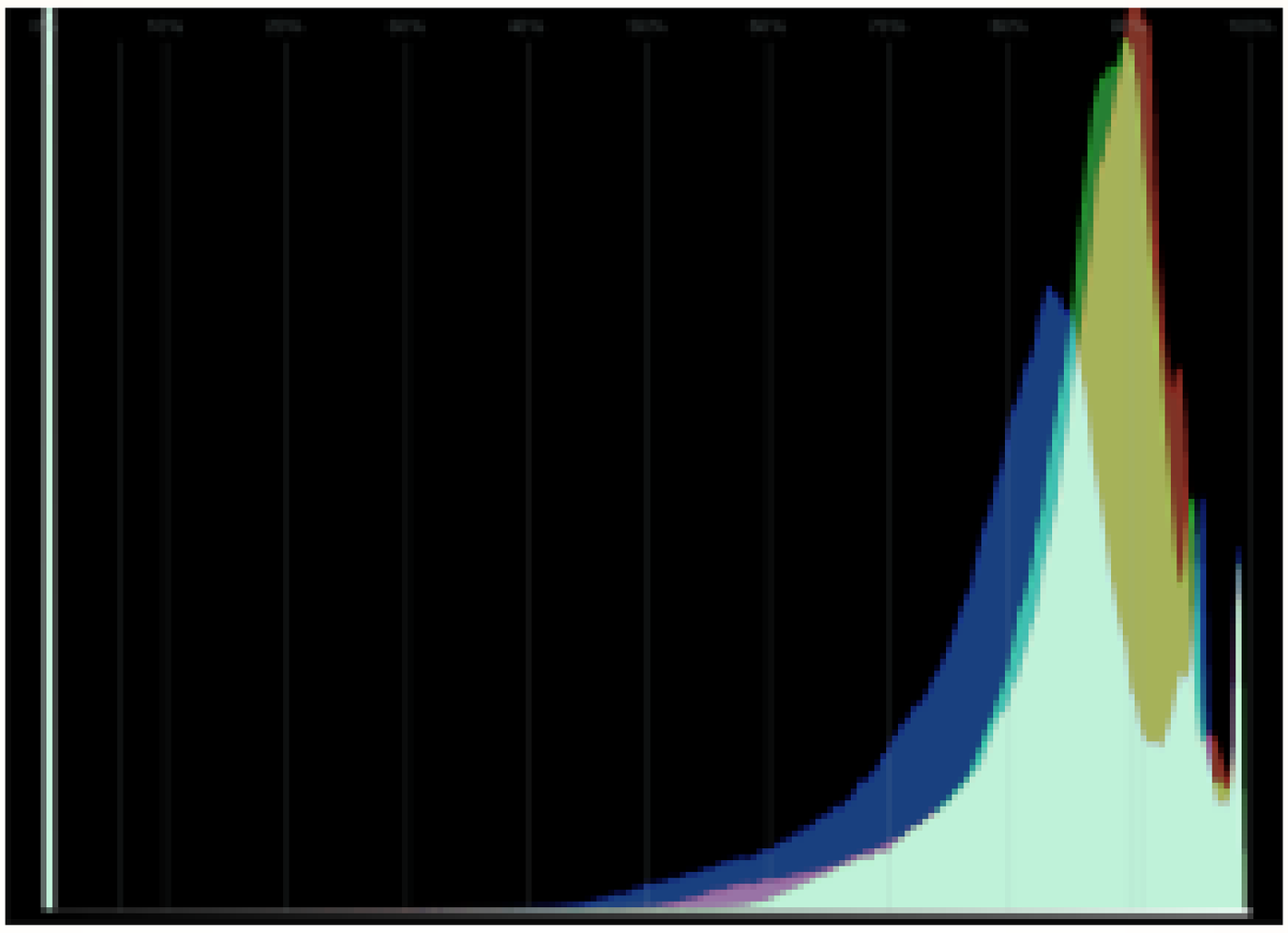
However, if we use the millimeter ruler we can measure the object exactly to its 382mm length, meaning we can see all the finest details in the picture.

Histogram

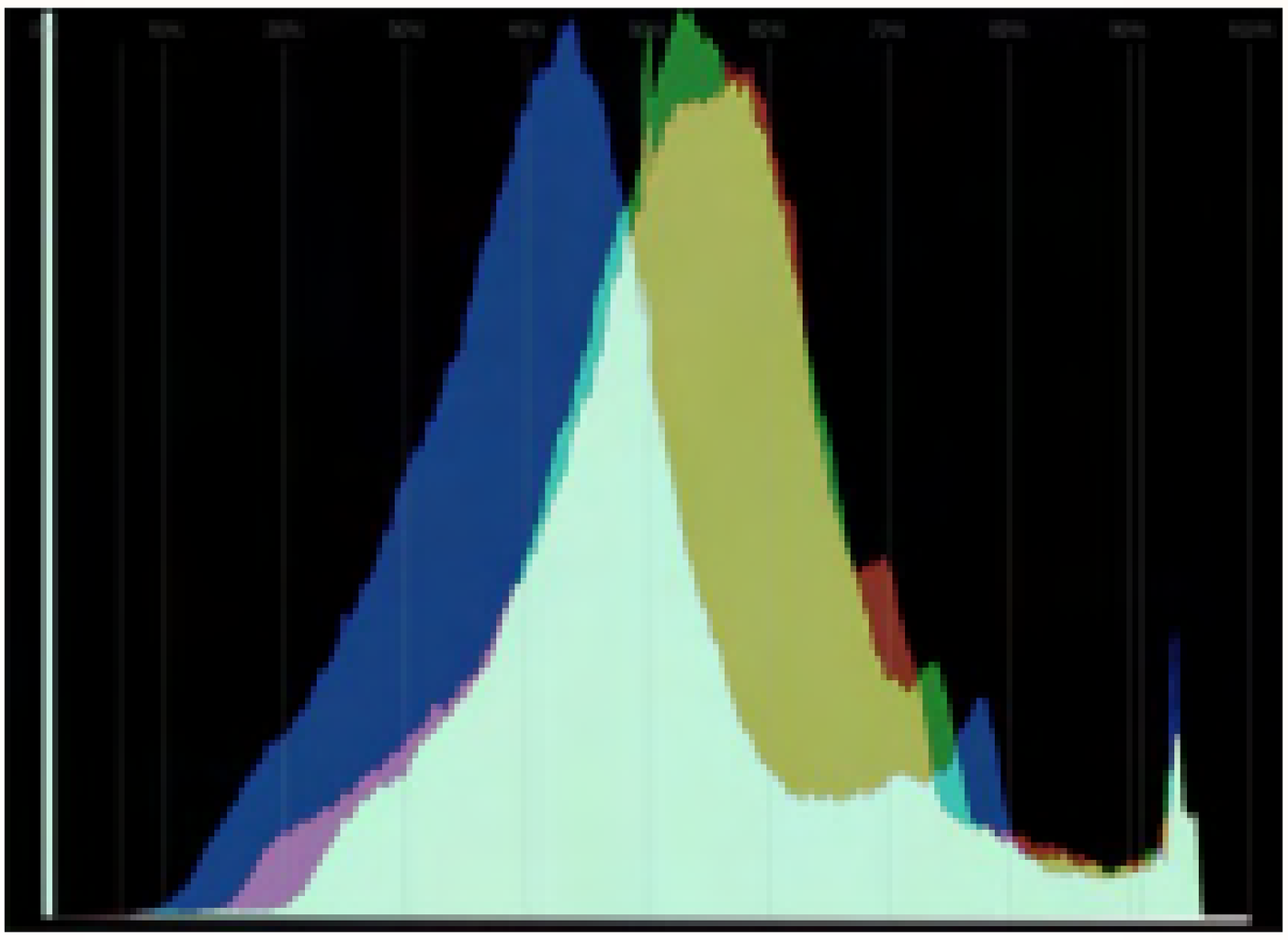
To find the optimal level of brightness(exposure), we can use the help of a tool called the histogram. This tool shows you a scale from the darkest point to the brightest point. So when you are taking a picture, you can see the level of luminosity on this scale. If the picture you are about to take would be underexposed, all the measured values would be close to the left side, which represents the darkest points.



If the picture you are about to take would be overexposed, all the measured values would be close to the right side, which represents the brightness.



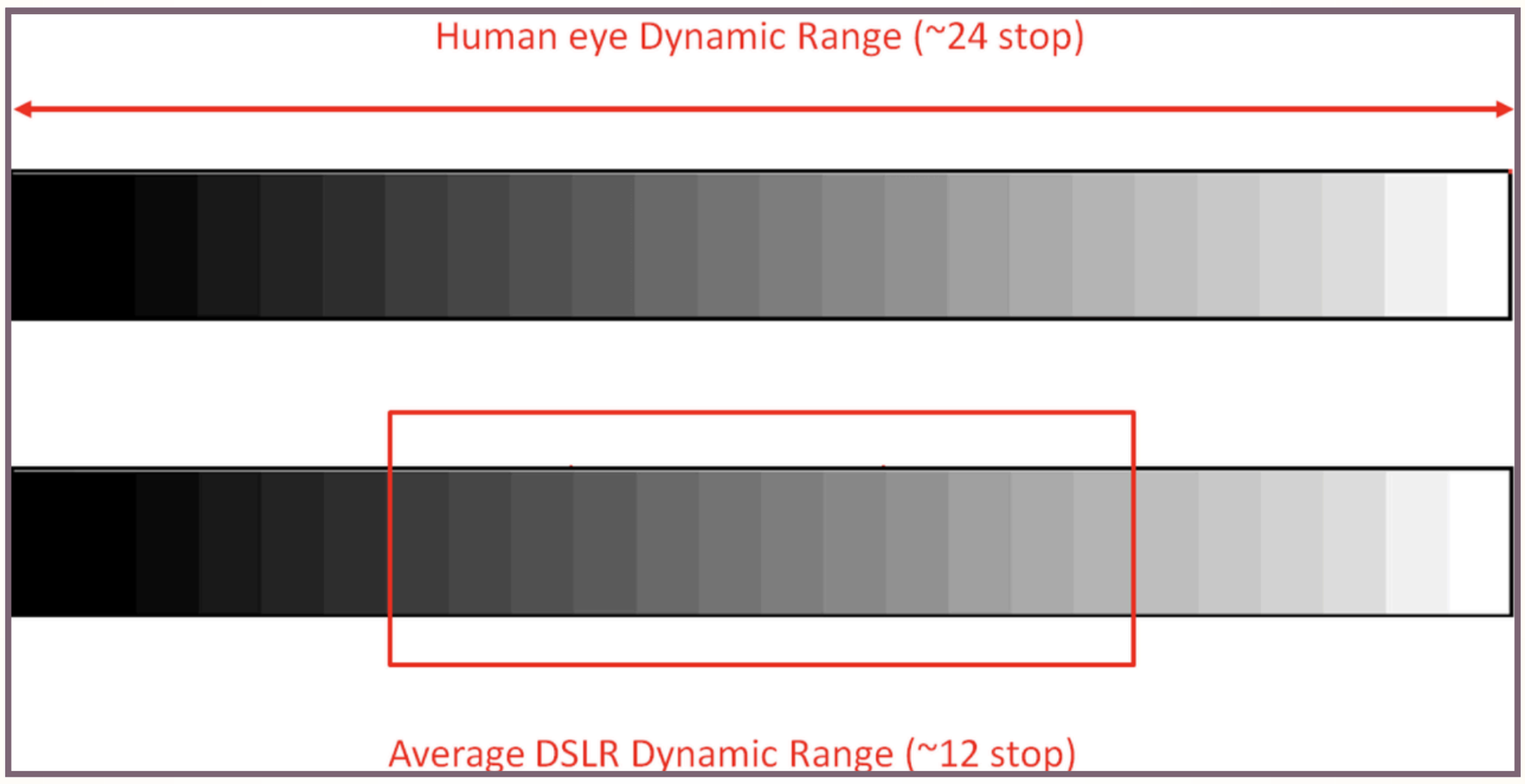
However, if the picture you are about to take would be just right in terms of the brightness, the measured values would be in the middle of the graph.



This tool can be found not only in professional cameras but also in many phone cameras.

Stop / Exposure value

The next technical term we would like to introduce in the chapter is the term Stop, which can be also referred to as the Exposure value. A stop of light is a way to measure the change in brightness of a photo. Each stop either doubles or halves the amount of light. If you increase by one stop, you are doubling the light, therefore you are making the photo brighter. Decreasing by one stop halves the light, making it darker. Adjustments can be made by changing the aperture, shutter speed and ISO settings or by just changing the amount of light in the scene.



References:

1.adobe.com

2.“Camera 101” presentation by Kaur Hendrikson

3.https://www.studiobinder.com/blog/what-is-dynamic-range-photography/

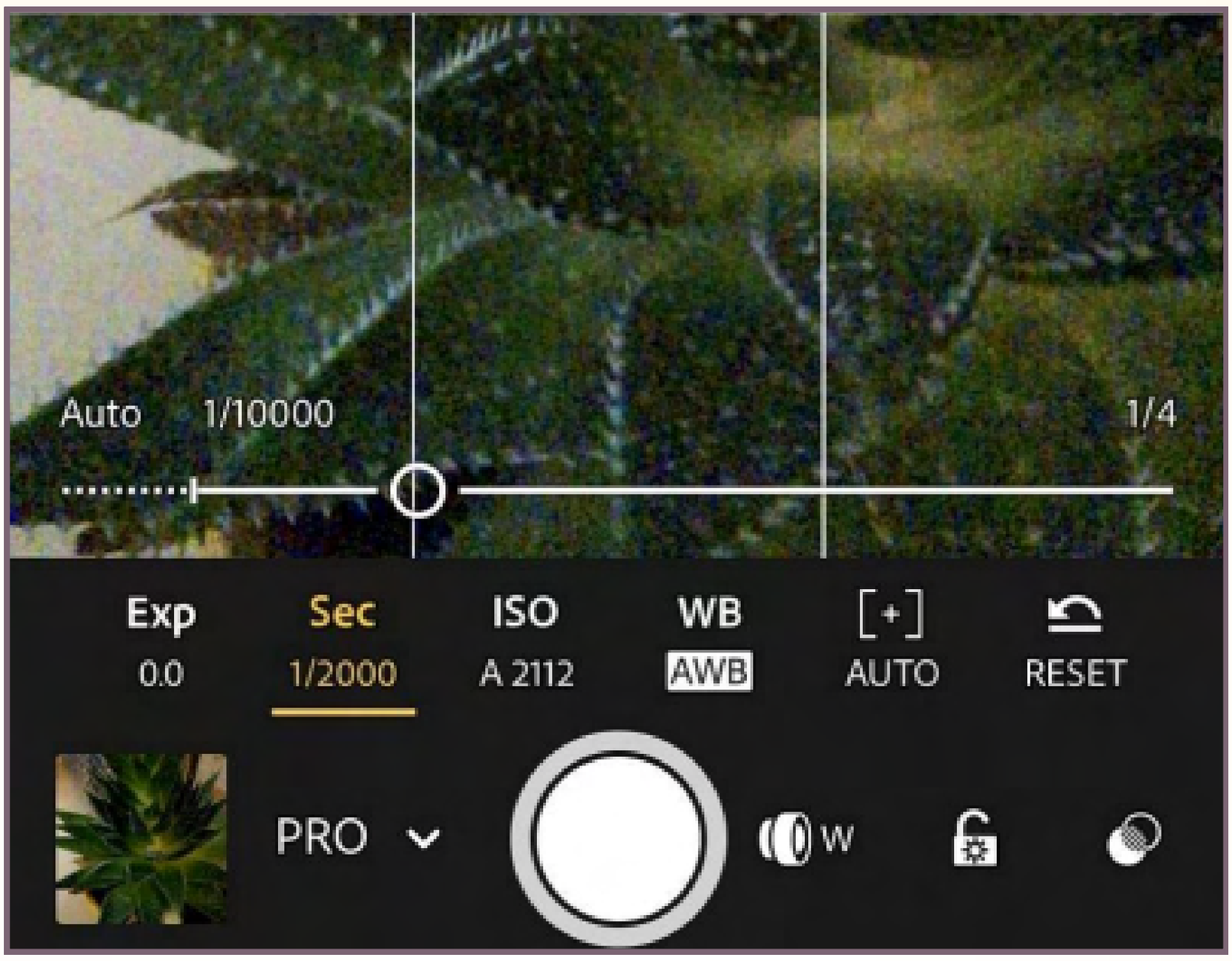
Shutter speed

Shutter speed can be defined as the length of time a camera's shutter (the device that stops any light entering the camera) is open. Its importance is based on the fact that it exposes the sensor to light, which in turn gives us an image. It is used to control the amount of light that forms an image on the sensor, allowing the user to increase or decrease the light that appears in the final image. Phones and mirrorless cameras do not have a physical shutter and instead control how much time is captured electronically. While it may seem useful to keep the shutter gain as low as possible to get the most light, this comes with certain disadvantages that must be considered: If the shutter speed is slow, it means that there is more time for the light to reach the sensor and it becomes sensitive to movement, which means that any slight movement of the camera or objects in the frame will blur the clarity of the frame or moving objects.

The example above calculates as one second divided by a selected number, which indicates the amount of time the shutter lets the light in for the sensor. It can be found on both cameras and smartphones.

Where to find shutter speed options on your device?

On your phone it would look approximately like this:



It can be used for artistic purposes, such as long exposure photography, commonly done on tripods to reduce the shakiness/movement, while getting more light in the picture. But if the camera moves, it will cause unwanted blur.

Photographed by Aleksas Murauskas. First image (top): 30s Second image (bottom): 30s, with accidental movement causing blur.

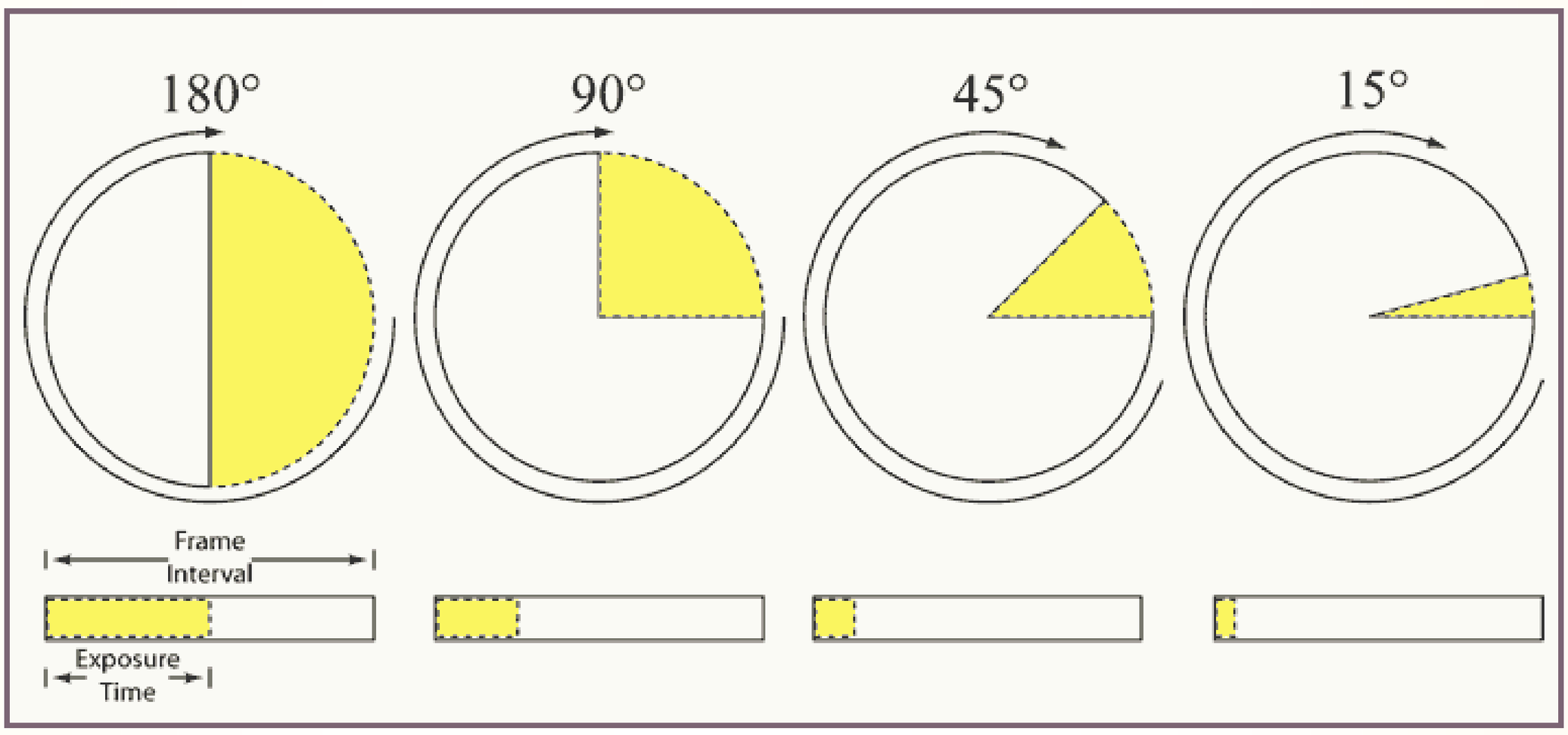
Photographed by Aleksas Murauskas. First image (top): 30s Second image (bottom): 30s, with accidental movement causing blur.

Camera movement is not the only thing causing blur: any movement during the exposure period is blurred not only by the camera movement, but external objects that move as well.

Photographed by Aleksas Murauskas. First image (left): 1/10. Second image (right): 1/800

At the other end, if the shutter speed is fast, you are able to capture objects that are moving fast with the downside of the sensor getting less light, therefore it needs to be compensated by opening up the aperture, increasing ISO or just increasing the amount of light to have enough light for the picture.

Shutter angle is an alternative to shutter speed and is measured in degrees. A shutter angle of 360 degrees exposes the image for the whole frame, i.e. with an fps of 25 an image would be captured for 1/25 of a second. 180 degrees would expose an image for half of the frame, i.e. with an fps of 25 the shutter speed would be 1/50 of a second.

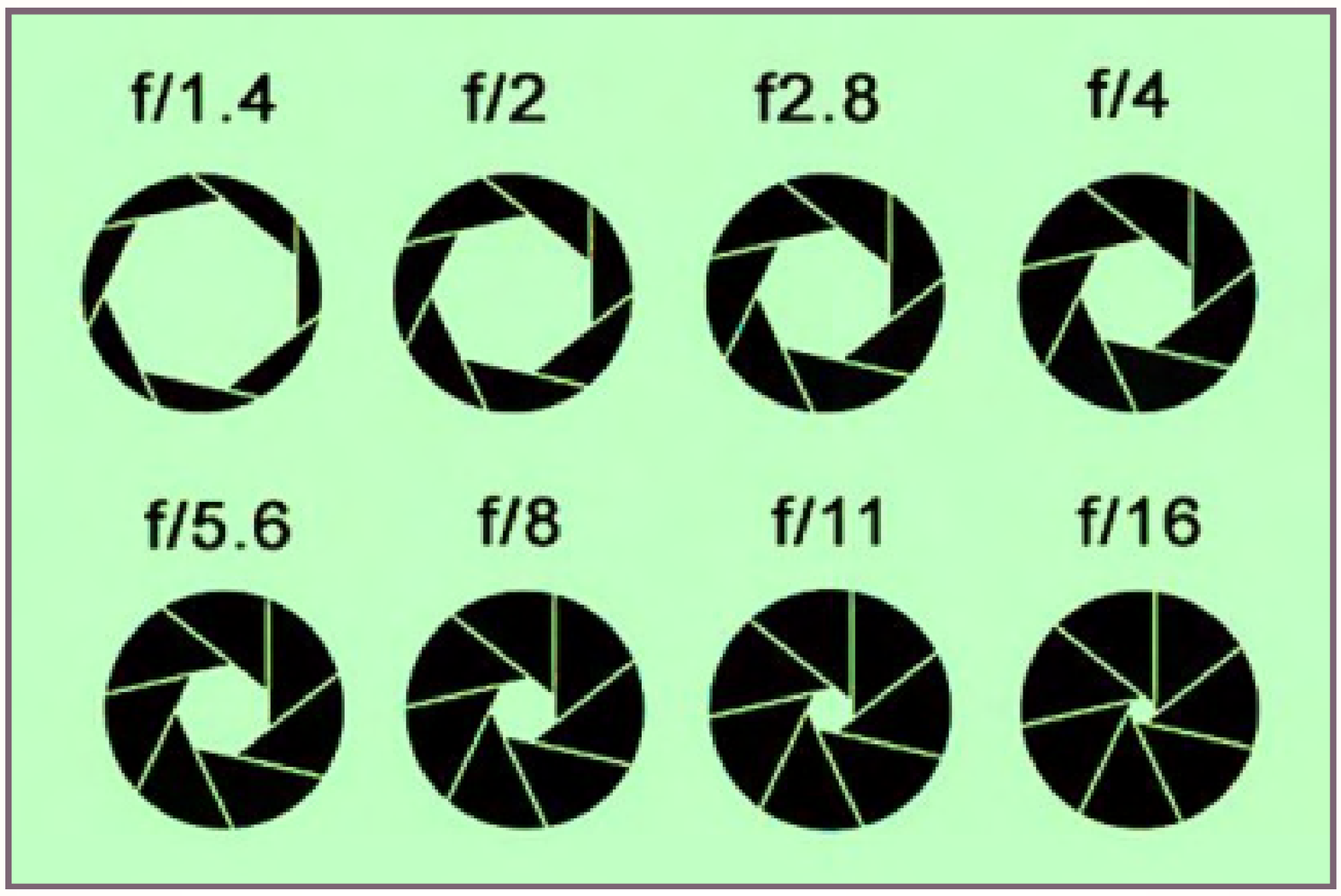


References:

1.https://themodestphotographer.com/what-is-shutter-speed-in-photography/
2.Understanding Shutter Speed - The Complete Guide For Beginners (bwillcreative.com)
3.How to change shutter speed on iPhone and how to change ISO (iphone-fotograaf.nl)
4.https://en.wikipedia.org/wiki/Rotary_disc_shutter

F - stop

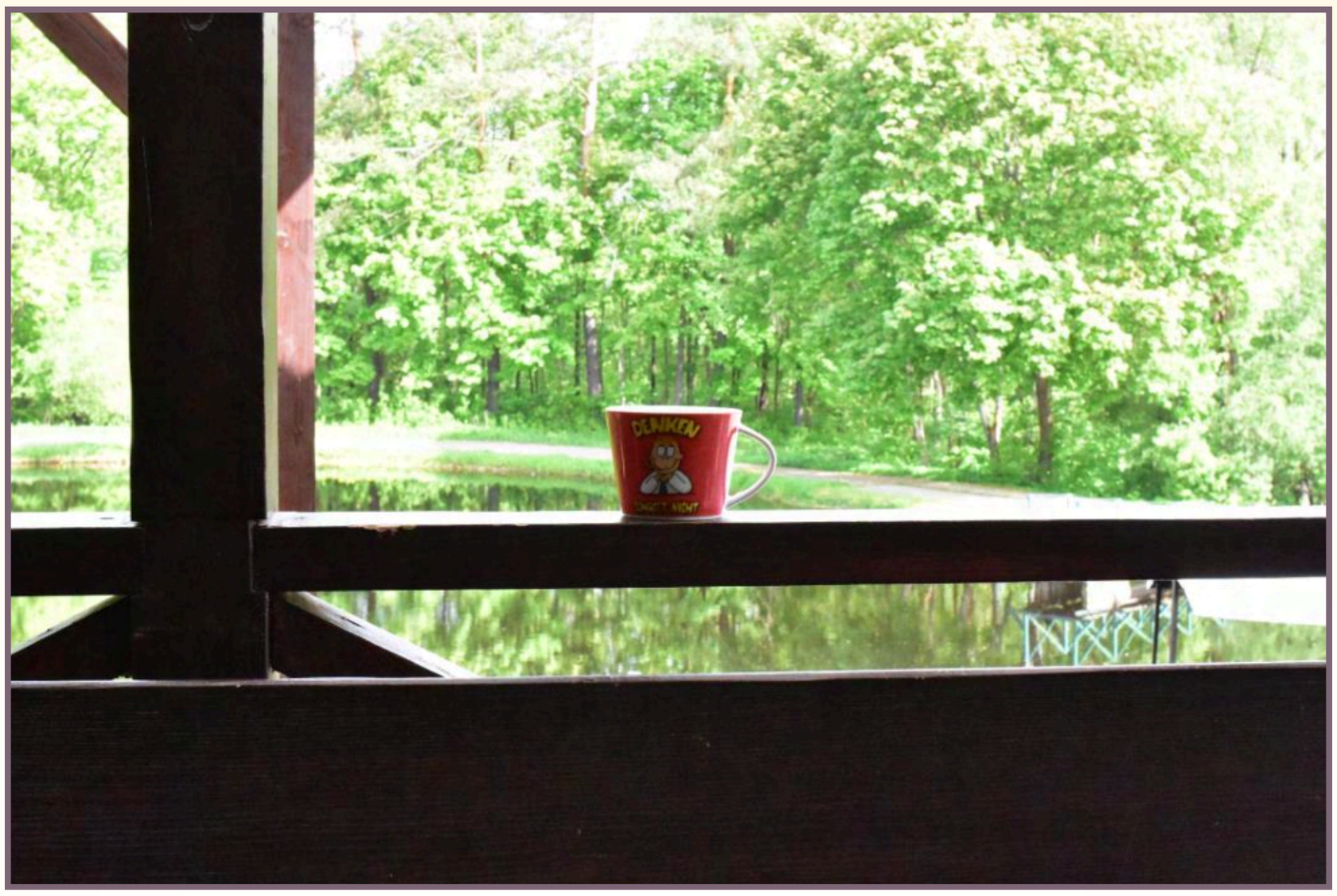
F-stop is a term used in photography to refer to the aperture setting of a camera lens. The hole in the lens called the aperture (also known as iris) regulates the amount of light that can enter a camera and changes depth of field.



Depth of field or DOF is the range of distance inside a scene that appears in focus.

f/4

Photograph made during the project “Shoot for the future”



f/16

Photograph made during the project “Shoot for the future”

A smaller f-stop (such as f/1.4) corresponds to a higher aperture and more light intake. A higher f-stop (such as f/16) on the other hand, corresponds to a smaller aperture and less light intake. f/1.4, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, and so on are examples of common f-stop values. The amount of light reaching the sensor is halved or doubled for each step between these levels, remember stops? In order to get the desired artistic effects, one needs to understand how to balance aperture settings with other exposure parameters. Keep in mind that lenses frequently have a "sweet spot" that is usually in the middle of the f-stop range where they function best in terms of sharpness and overall image quality.

Different lenses can have different maximum and minimum f-stop values. While some lenses have larger apertures and are therefore "faster" (ex. f/1.4), others are "slower" (ex.f/4). In contrast to zoom lenses, prime lenses frequently feature larger apertures, which provide more flexibility in low light and offer a shallower depth of field.

Depending on the f-stop, some lenses can have optical problems including distortion, vignetting, chromatic aberration or decreased sharpness while using the extreme f stops (very wide or very narrow).

Here are examples how f-stop settings are typically used:

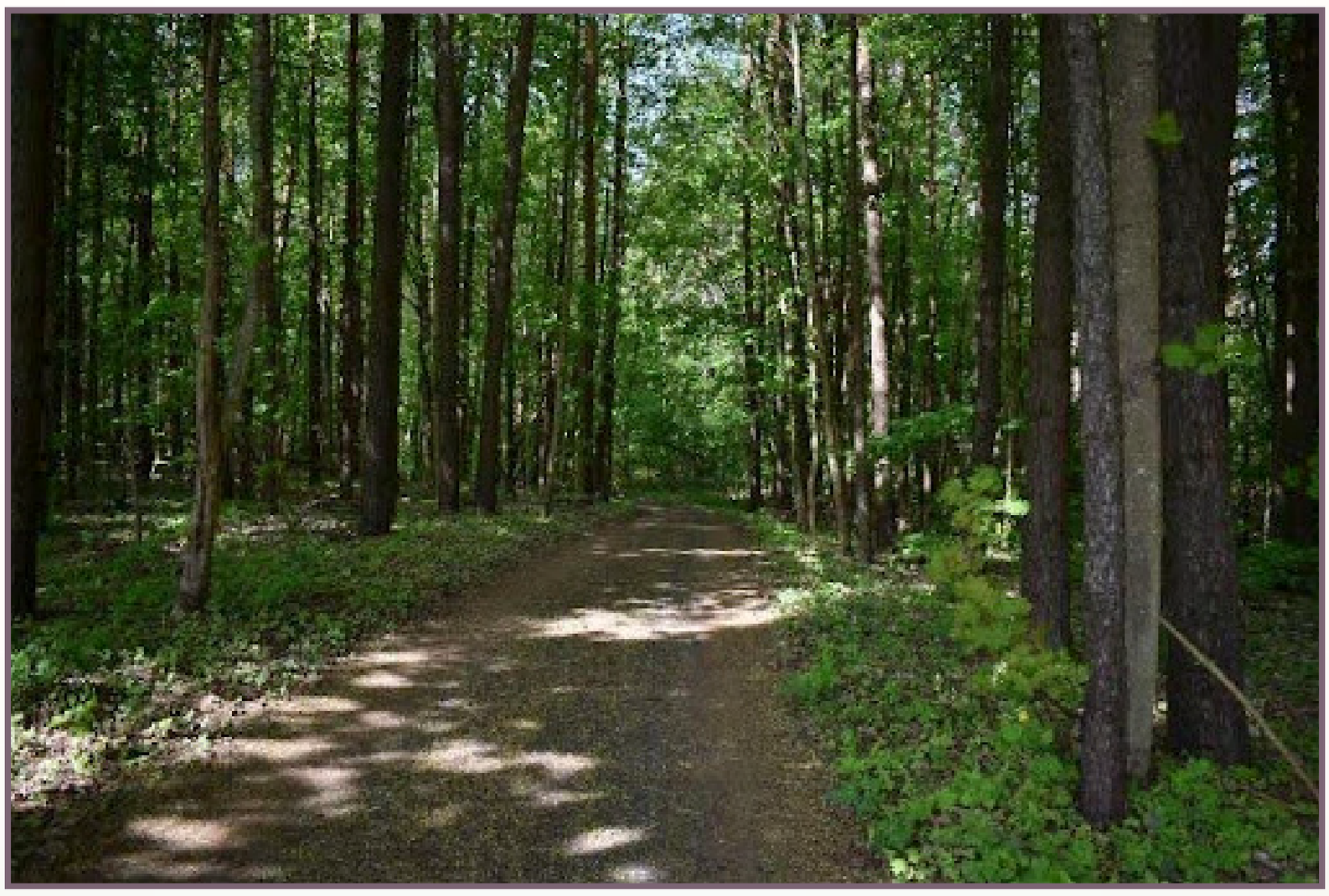
- For close-ups or portraits, wide apertures (low f-stop) are often used to separate the subject from the background.
- For landscape photography, narrow apertures (high f-stop) work best to keep everything in focus.

References:

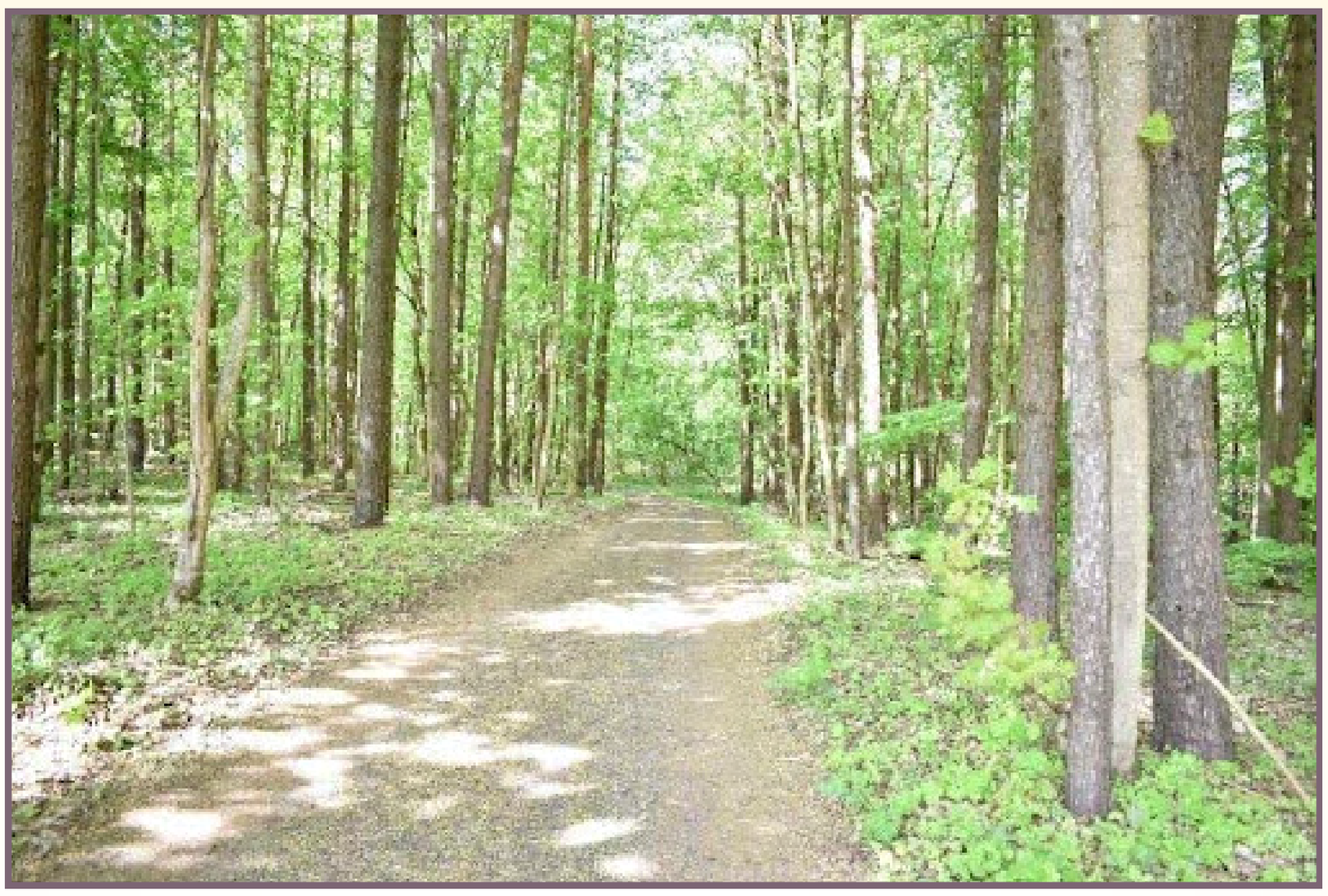
https://www.shutterbug.com/content/watch-2-minute-video-how-fstop-scale-works-and-you-can-forget-confusing-math

ISO

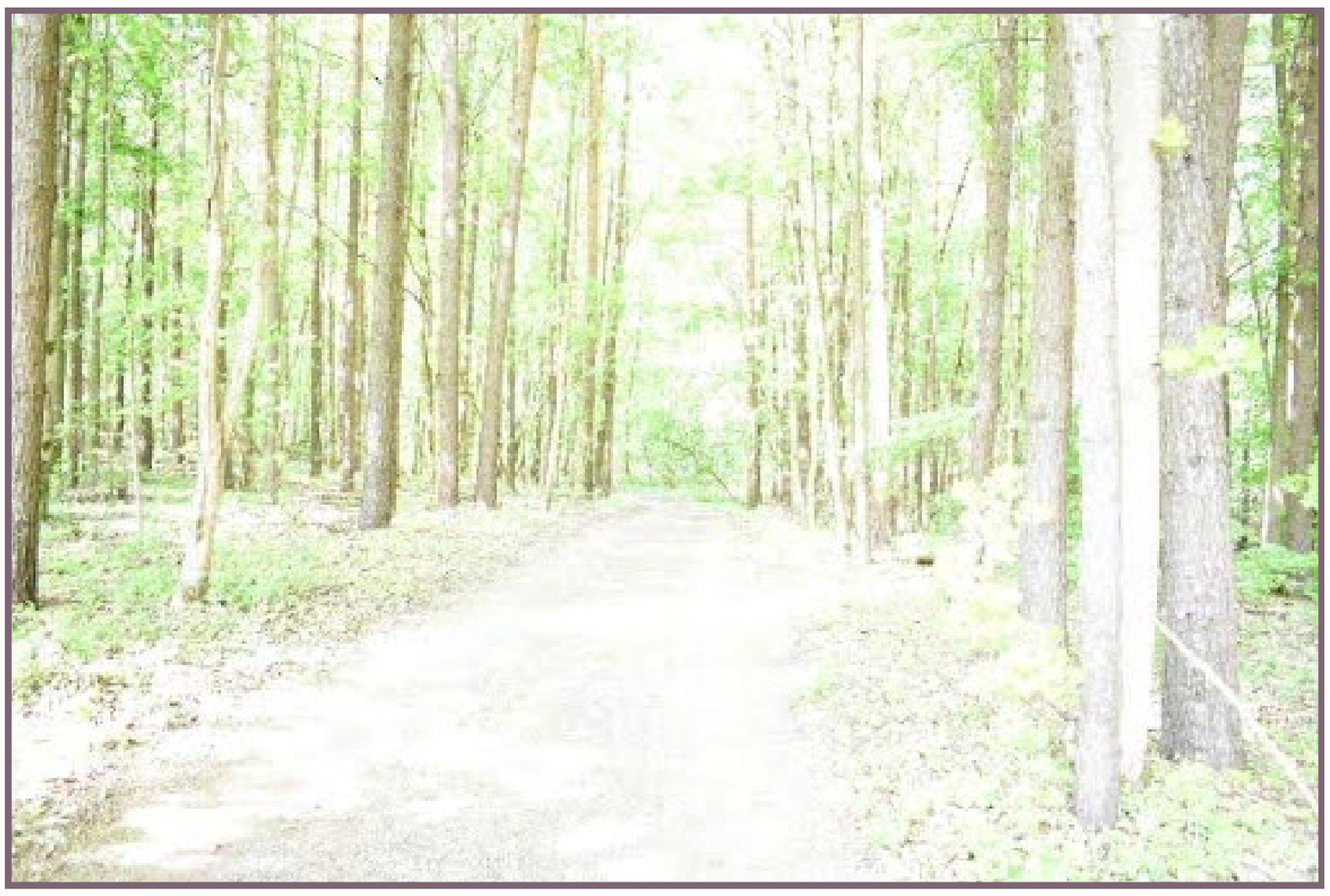
ISO is the third and last manual setting after shutter speed and F-stop. Why last? It is usually the last setting you want to change and you will see why in the examples below. ISO stands for the International Organization for Standardization which made the standard for it. It is an amount of digital brightness that the camera is adding before saving the photo (dual base ISO sensors are an exception). It affects the brightness and the noise of the photo. Values of ISO are represented by numbers:…,100, 200, 400, 800, 1600, 3200, 12800, 25600,…Higher the number, higher the brightness.



ISO: 100



ISO: 800



ISO: 3200

ISO: 25600

20

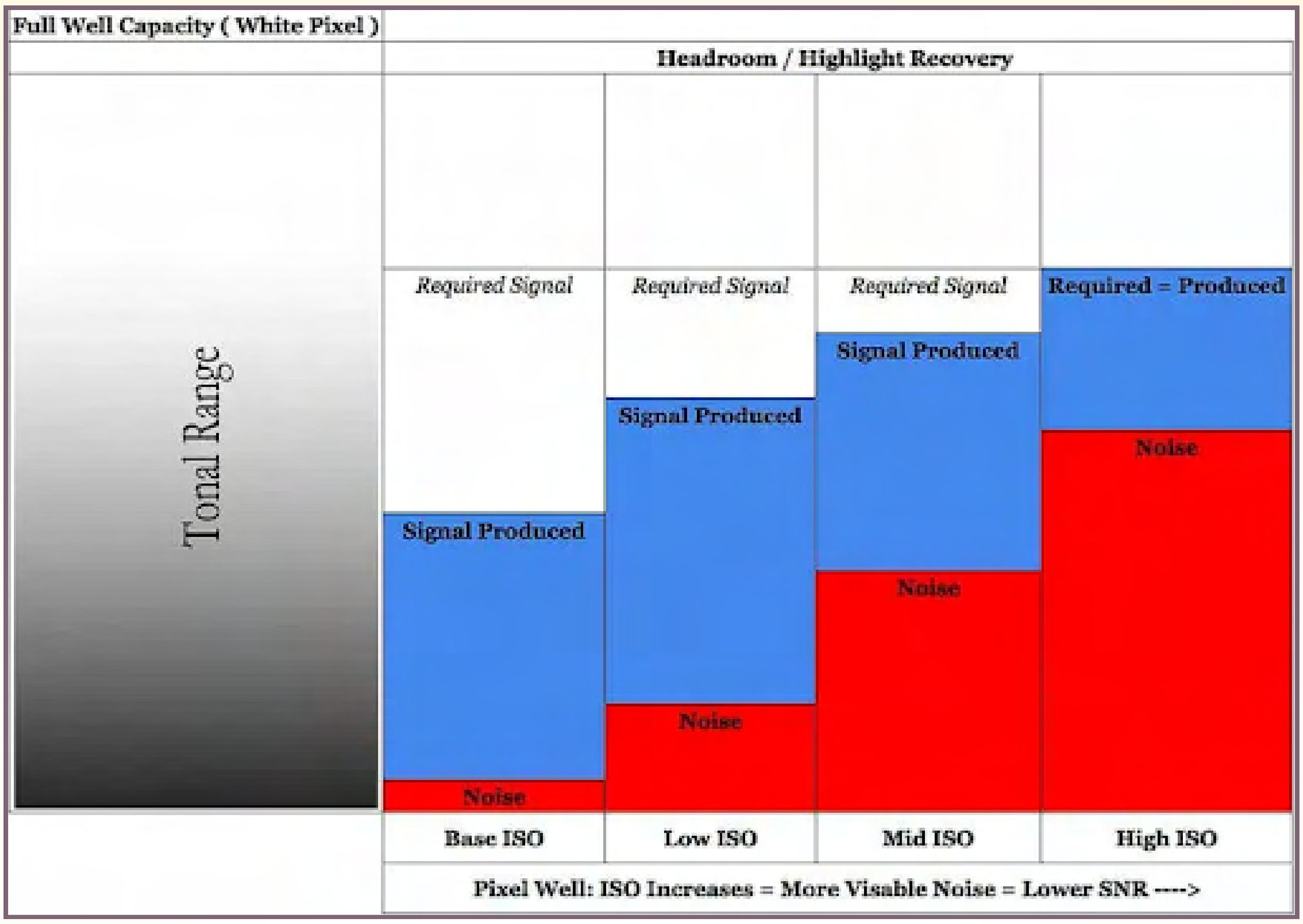
But higher the number, the more visible noise appears in the photo. Every photo has noise, it's inherent to how light works, but by setting a higher ISO, you brighten the image along with the noise that is already there.

ISO: 100 - low amount of visible noise

ISO: 25600 - more visible noise

Real life situations

As we mentioned above, ISO is the last setting you want to touch and change. When you have enough light you should keep the ISO at the lowest number your camera is able to set. Why? You do not want unnecessary noise in the photo. But there are situations when you do not have enough light. In that case try to use a slower shutter speed and open up the aperture. But remember to be careful with shutter speed as setting it too slow can result in blurry photos. You can either bump up the ISO to keep the shutter speed faster so you do not have blurry photos or you can keep the shutter speed slower and use a tripod to prevent blur from shaky hands. In general it is better to have noisy photos than blurry ones. So do not be afraid to use higher ISO if needed.



References:

https://www.davemorrowphotography.com/iso-photography

White Balance

The human eye can sense that "white things are white," even when the light has some slight coloring. Cameras, however, are different – without any white balance adjustment, a photo depicts the same exact colors as the original light source. For example, fluorescent lights appear green, while incandescent light bulbs look orange.

In-Camera White Balance

The white balance in the human brain adjusts automatically to different lighting conditions, ensuring that we perceive colors accurately. Cameras, on the other hand, rely on automatic or manual adjustments to achieve similar color accuracy based on the type of lighting.

Color Temperature (Kelvin)	Light source
10000-15000	Clear sky
6500-8000	Cloudy sky/shade
6000-7000	Daylight/Midday light
5500-6500	Average daylight
5500-5000	Electronic flash
4000-5500	Moonlight
3000-4000	Sunrise/Sunset
2500-3000	Domestic light
1000-2000	Candle flame

The color temperature (Kelvin) of different light sources

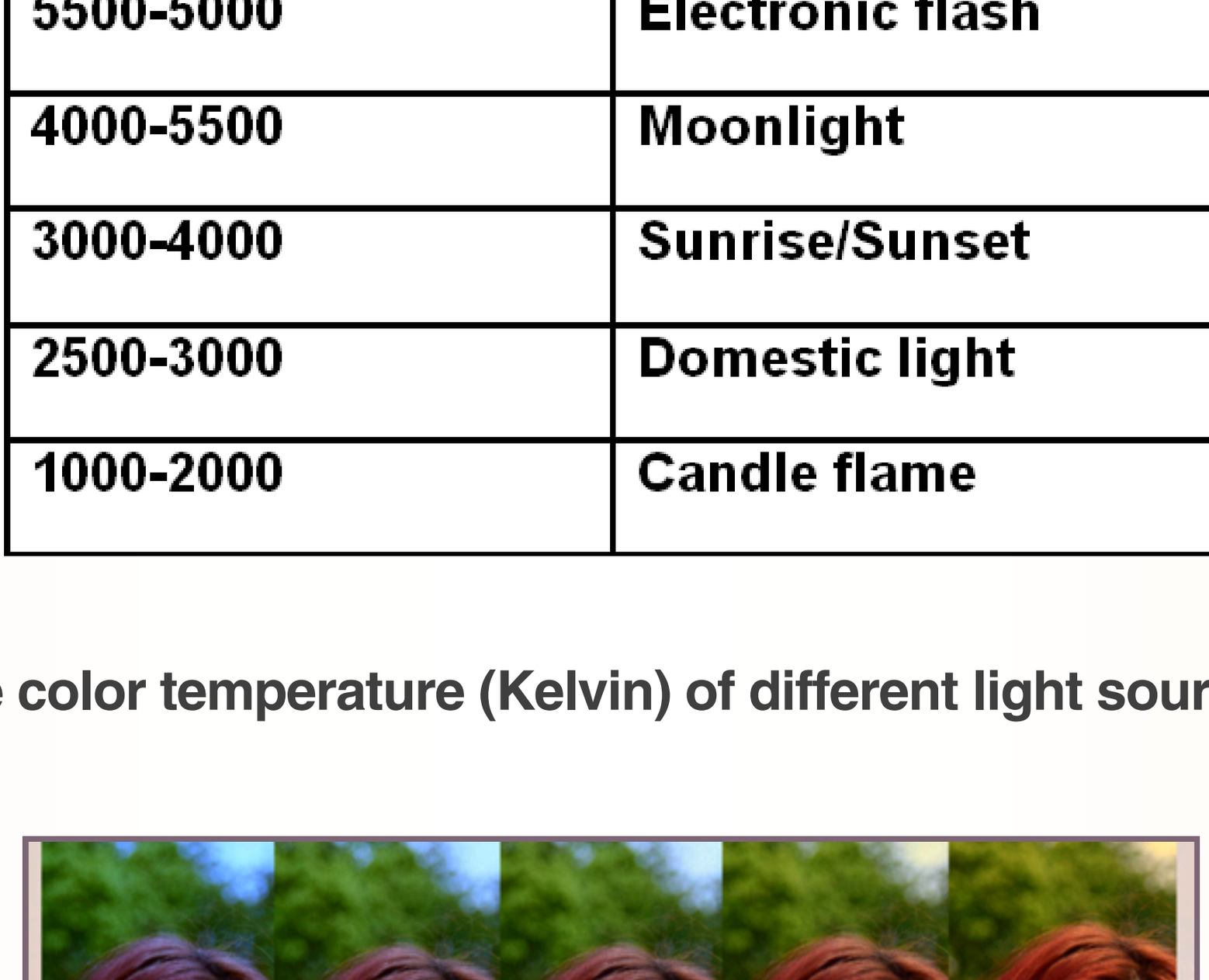


Image generated during the project “Shoot for the future”

White balance is especially important for footage taken indoors, lit with artificial light sources. Light emitted by lamps is not perfectly white, this could make your footage look unnatural and off. Footage taken during the night or in low-light settings tends to need manual adjustments. Same goes for scenes that are mostly single color, a prominent example are closeups on flowers and grass. Sometimes, automatic settings could ruin the desired artistic effect - when filming sunsets one might prefer to adjust the white balance manually to keep the atmosphere of the scene.

References:

https://www.ricoh-imaging.co.jp/english/r_dc/photostyle/knowledge/basic/white/whats.html#:~:text=The%20function%20that%20corrects%20this,of%20your%20pictures%20at%20will.

Lenses

Most common types of lenses are:

Standard lens (35mm to 85mm): Most similar to the human eye

Telephoto lens (85mm and above): Suited for nature and sports photography or videography also astrophotography etc.

Wide angle lens (24mm to 35mm): Perfect for panorama and landscape photography. Or extreme wide angle lens (Less than 16mm): Suited for capturing sports activities in a first-person perspective.

Fisheye lens (4mm - 14mm): Abstract, creative photography or videography (music videos etc.).

Macro lens: Best for close-up shots enlarging small subjects.

Standard Lenses

They're good for lots of different types of pictures, from portraits to group shots. They're not too zoomed in or too zoomed out, just right for many situations. Ideal for portrait and food photography. They're good for most common pictures.

Telephoto Lenses

Telephoto lenses let you zoom in really far away to take pictures of things like birds in the sky or players on a sports field. But they tend to be bulky and may require a tripod to support them. If you are a professional wildlife photographer, sports photographer, or if you photograph the night sky and the stars, then a telephoto lens can be invaluable.

Wide Angle Lenses

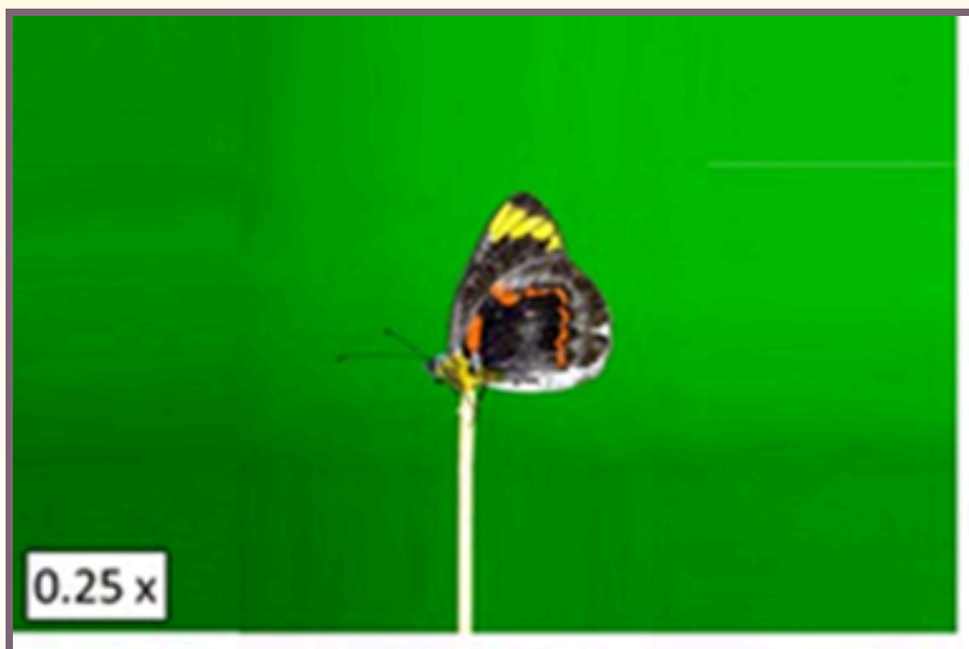
They're the best choice for taking pictures of big landscapes or streets because they can fit a lot into one picture. Almost everything looks clear and sharp, unless it's really close to the lens.

Fisheye lenses

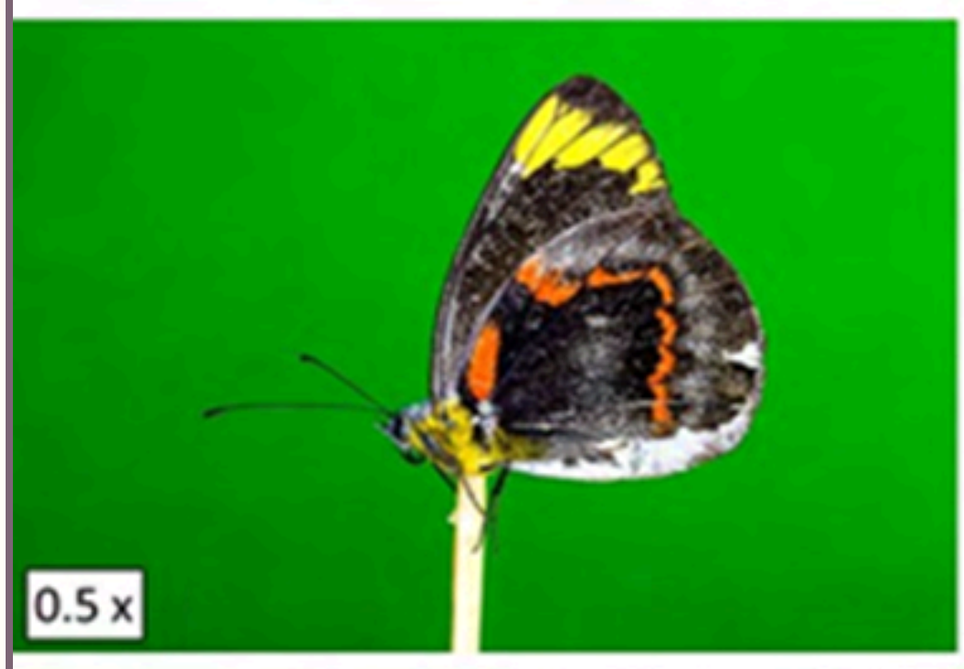
Fisheye lenses can capture a really wide view, almost like a bubble, which makes everything look curved and cool. It creates an unusual, stretched effect, similar to a GoPro image. A fisheye lens is basically an ultra-wide-angle lens, offering an enormous field of view. These are more specialist lenses and aren't generally needed by most videographers. They are useful if you are photographing indoors or using your camera for design work.

Macro Lenses

They're used for taking really detailed pictures of small things, like insects or flowers. They can capture all the tiny details that our eyes might miss.



Various zoom and kit lenses at closest focus point



e.g. Canon 50mm and Zeiss 100mm 0.5x “macro” lenses

True 1.0x macro lenses: various focal lengths, e.g. 40mm, … , 200mm.

Canon MP-E 65mm 1.0x - 5.0x specialty macro lens

References:

1.https://www.all-things-photography.com/standard-lens/

2.https://www.blog.juliatrotti.com/

3.https://www.naturettl.com/choosing-first-telephoto-lens/

4.https://www.adobe.com/creativecloud/photography/discover/telephoto-photography.html

5.https://shotkit.com/best-wide-angle-lens/

6.https://www.iphotography.com/blog/creative-angles/

7.Taro Hama @e-kamakura / Getty Images

8.https://www.ssccphotography.org/macro-approaches-by-dennis-freeman/

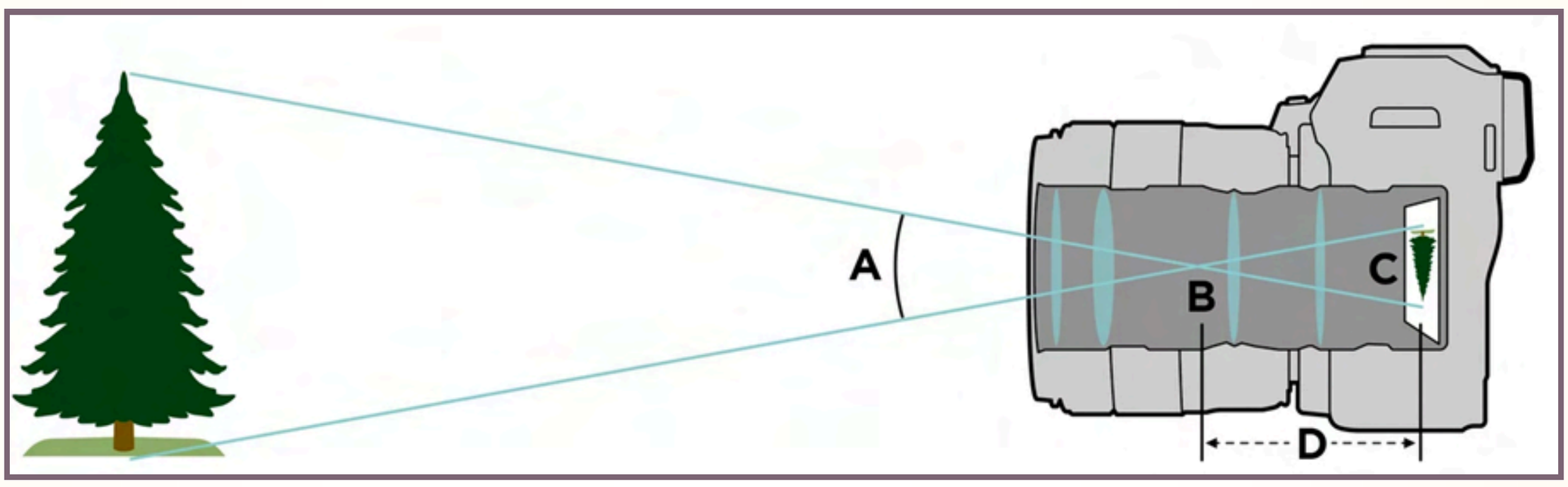
9.https:/www.learningwithexperts.com/photography/blog/the-standard-lens

10.https:/www.lifewire.com/what-is-a-fisheye-lens-4774336

11.https:/www.adorama.com/alc/wide-angle-vs-telephoto-which-lens-should-you-choose/am

Focal Length

Focal length (D in the picture) is the distance from the lens's optical centre (B in the picture) to the image sensor (C in the picture). In a film camera, the focal plane is the film; in a digital camera, it's the sensor.



It serves as a pivotal characteristic, distinguishing lenses into two primary categories: Prime Lenses and Zoom Lenses. Prime lenses offer a fixed focal length, while zoom lenses provide a range of focal lengths, giving photographers flexibility in composition. However, it doesn't necessarily mean that the latter is better, which is a common misconception.

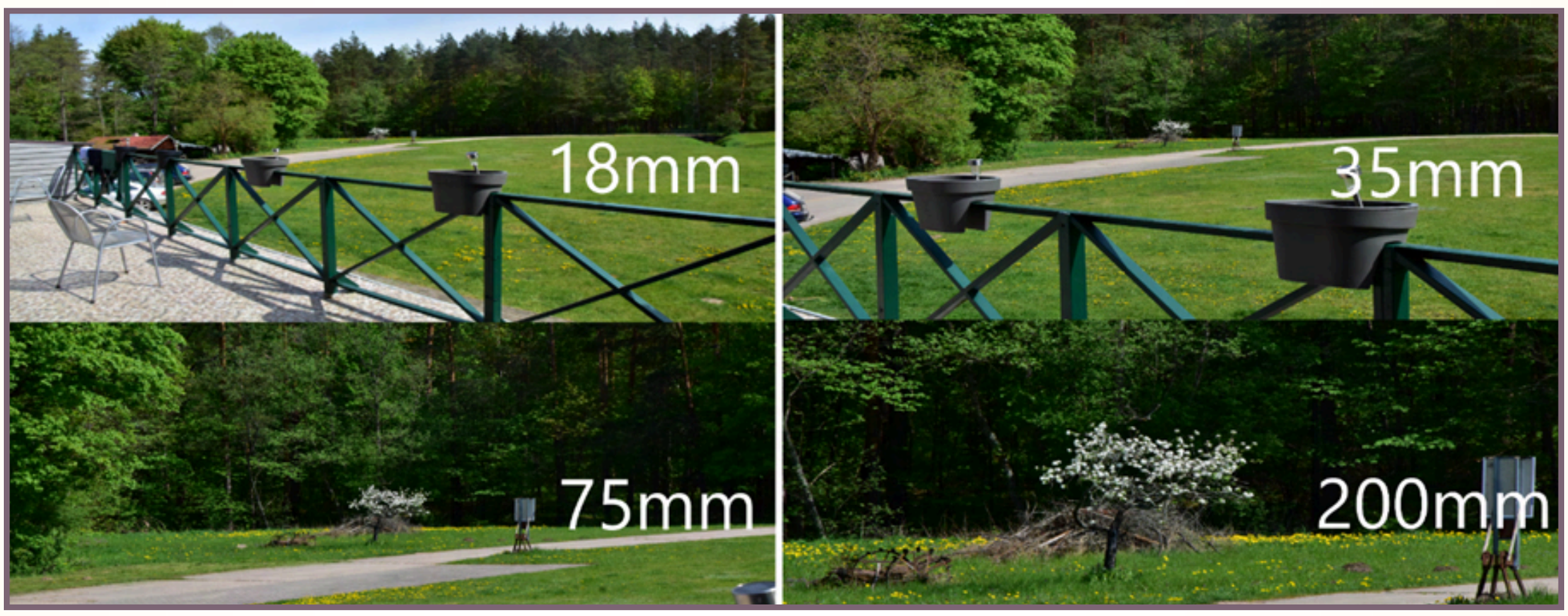
References:

1.Understanding Lenses: Unraveling Optical Characteristics | Shanghai Optics (shanghgai-toptics.com)
2.Understanding focal length - Canon Georgia

Zoom lenses vs. Prime lenses

Zoom lenses

These kinds of lenses are made for multiple distance photography or videography. With those kinds of lenses the user can adjust how big a subject appears in the photo without moving closer or further, but just by rotating a control ring on the lens. These lenses are perfect for events, wildlife, or travel photography.



Prime lenses

With a prime lens the user cannot zoom in or zoom out. As these kinds of lenses have fewer moving parts, they tend to be cheaper or are of higher quality at the same price of an equivalent zoom lens.

References:

1.https://kolarivision.com/what-is-infrared-photographyhttps:/omaxphoto.com/blogs/news/basic-top-5-types-of-camera-lenses
2.https:/www.photoguard.co.uk/camera-lens-guide
3.https:/omaxphoto.com/blogs/news/basic-top-5-types-of-camera-lenses
4.https:/www.adobe.com/th_en/creativecloud/photography/discover/tilt-shift-photography.html
5.https:/www.wavelength-ir.com/lwir-infrared-lens-athermal-deisgn-product

FPS

FPS or Frames Per Second refers to the number of individual frames or images captured by a camera in one second. It is the standard unit to measure frame rate.

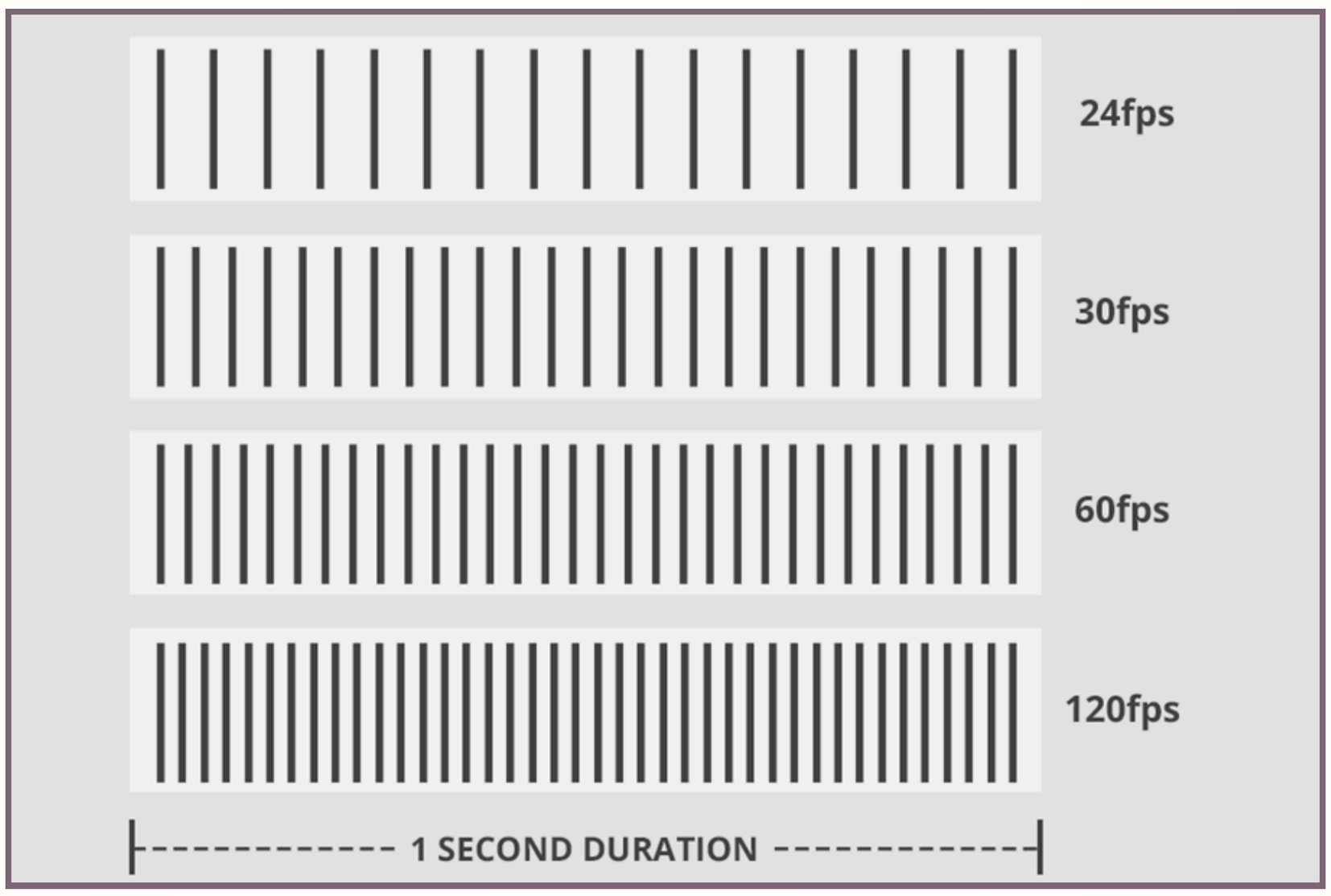
FPS in Photography

The speed at which a camera can shoot depends on several factors. These include the speed at which the shutter/ mirror mechanism can re-cock itself and the speed of the camera's internal memory. Higher end cameras use faster internal memory which allows more photos to be written to it in a shorter time.

Sports and wildlife photographers pay the most attention to FPS because it can really make the difference when trying to capture the perfectly timed shot.

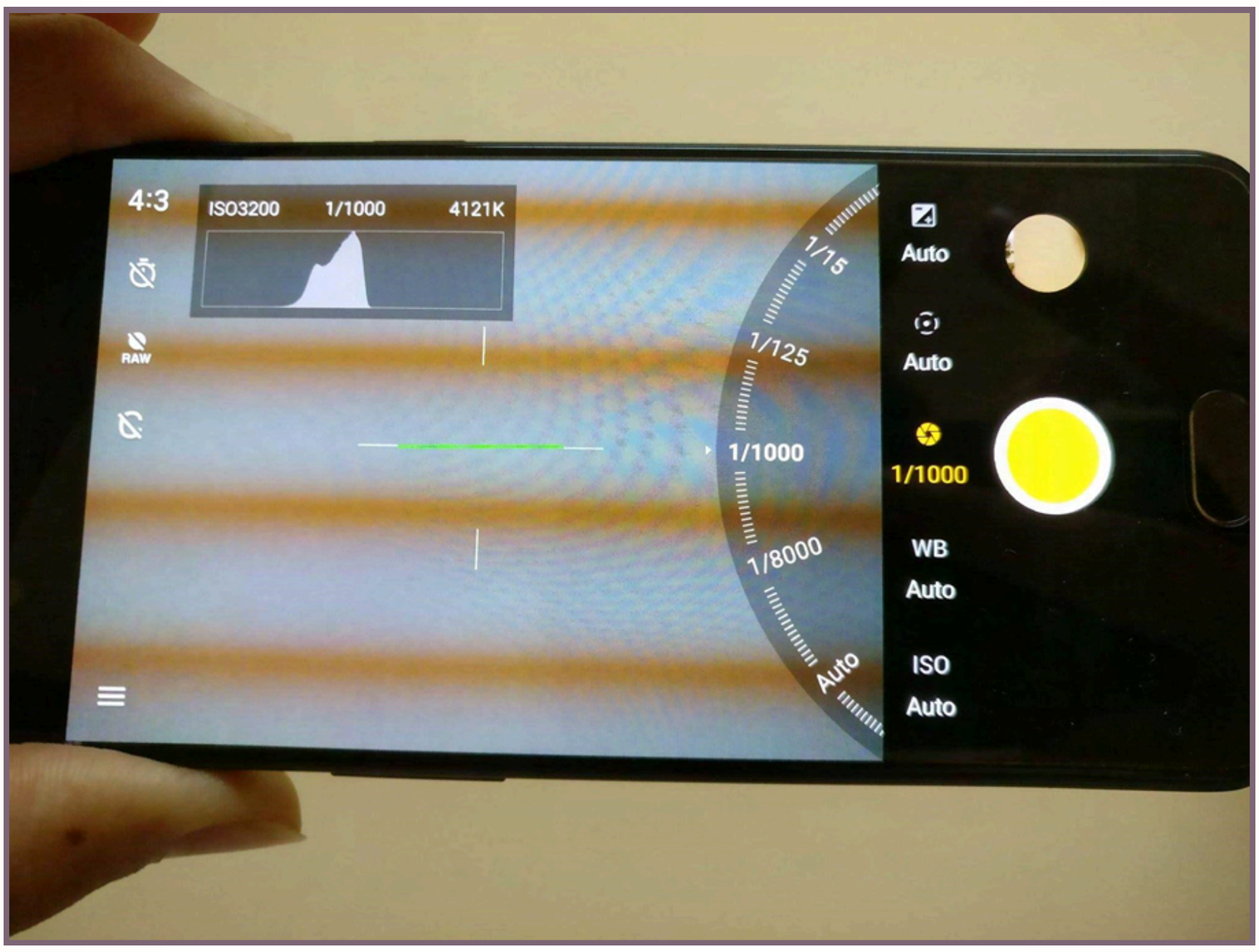
FPS In Videography

1. 24/25 FPS - used for films. This standard looks the most natural and helps to avoid hyper realism that can be achieved with high frame rates (60 FPS, 120 FPS and higher).
2. 30 FPS - used for online video. As it has more frames per second, it looks smoother.
3. 50/60 FPS - used in television and sports.
4. 120+ - used for recording slow motion video.



Flickering Lights in Video: Understanding the Cause and Finding a Fix

Ever filmed a scene that looked perfect to the naked eye, but ended up with annoying flickering lights in the playback? This is a common issue in videography, and it arises from a mismatch between the way your camera captures light and the way your power grid operates.



The Culprit: The Flickering Effect

The flickering you see in your video is often caused by the alternating current (AC) powering your lights. In most regions, AC electricity cycles at a specific frequency, typically 50 Hz (Europe) or 60 Hz (North America). This cycling can cause slight fluctuations in the light output, imperceptible to the human eye but picked up by your camera.

When Frames and Flickers Collide

Your camera captures video by taking still images (frames) at a certain rate, measured in frames per second (FPS). If the frame rate doesn't sync up perfectly with the AC cycle, you can get inconsistencies in how much light is captured in each frame. This mismatch creates the flickering effect in your video.

Banishing the Flicker

There are several ways to combat light flicker in videography:

Adjusting Frame Rate (FPS): Try setting your camera's frame rate to match the AC frequency. For example, use 60 fps in North America and 50 fps in Europe. This increases the chances of capturing a consistent light level in each frame.

Shutter Speed Manipulation: Experiment with your camera's shutter speed. The "180 degree rule" is a starting point, where the shutter speed is the reciprocal of twice the frame rate (e.g., 1/120 for 60 fps). However, for situations with flickering lights, adjusting the shutter speed in small increments around this value can sometimes find a sweet spot that minimizes flicker.

Embrace Constant Light Sources: Consider using LED video lights designed for filming. These lights provide a continuous light output, eliminating the flicker issue altogether.

Post-Production Techniques (Limited Fix): While not ideal, some video editing software offers tools to reduce flicker in post-production. These methods have varying degrees of success and may introduce artifacts in your video.

Remember: Experimentation is key! Try different combinations of frame rate and shutter speed to find the setting that best eliminates flicker in your specific lighting scenario.

References:

1.https://shuttermuse.com/glossary/frames-per-second/

2.https://wistia.com/learn/production/what-is-frame-rate

3. https://shotkit.com/frame-rate-vs-shutter-speed/

Camera movement

Camera movements are an important part of videography and filmmaking. They can enhance the outcome of the photos and videos and help to tell the message that you want to pass across to the viewers. There are different kinds of camera movements,we have added illustrations to help you understand the topic better and linked all of them to and object that can help you achieve the result wanted (Tripod, Gimbal and Handheld)

Dolly

Dollying is a television and filmmaking technique that helps to add depth to a scene. A camera dolly system helps to achieve smooth camera movements, but is very expensive. You can get a similar effect by placing a tripod into a shopping cart or a car (Masterclass.com, 05/05/2024).

The dolly movement is a great way to create a sense of progression or pursuit, or enhances the feeling of being part of the action.

Jib/Boom/Crane

Booming is when you move the camera up or down, where you put a camera at one end of a metal rod and a counterweight at the other end. Jib movement captures high or low angles for dramatic effect, or provides dynamic movement in a scene.

Truck

Similar to dolly, the main difference is in the direction in which the camera moves. In a truck shot the camera moves side to side on a horizontal plane. This allows you to follow a character while they are walking. You can recreate it with the help of a skateboard or a shopping cart (storyblock.com, 05/05/2024).

Pan

A pan movement is when the camera rotates horizontally from a fixed position either left or right. You can use this camera movement to establish location and subjects. Panning is considered a relatively basic camera movement, but it is a highly versatile way to set a scene. It helps for the tracking of people or objects and makes smoother shots (storyblock.com, 05/05/2024).

Tilt

A tilt movement is similar to a “pan movement” but the main difference between them is that the camera rotates upwards and downwards on a vertical axis. An example is when you nod your head up and down. Downward tilts tend to help with observing over a large area while upward tilts may evolve the feeling of fear or weakness in a character (studiobinder.com, 05/05/2024).

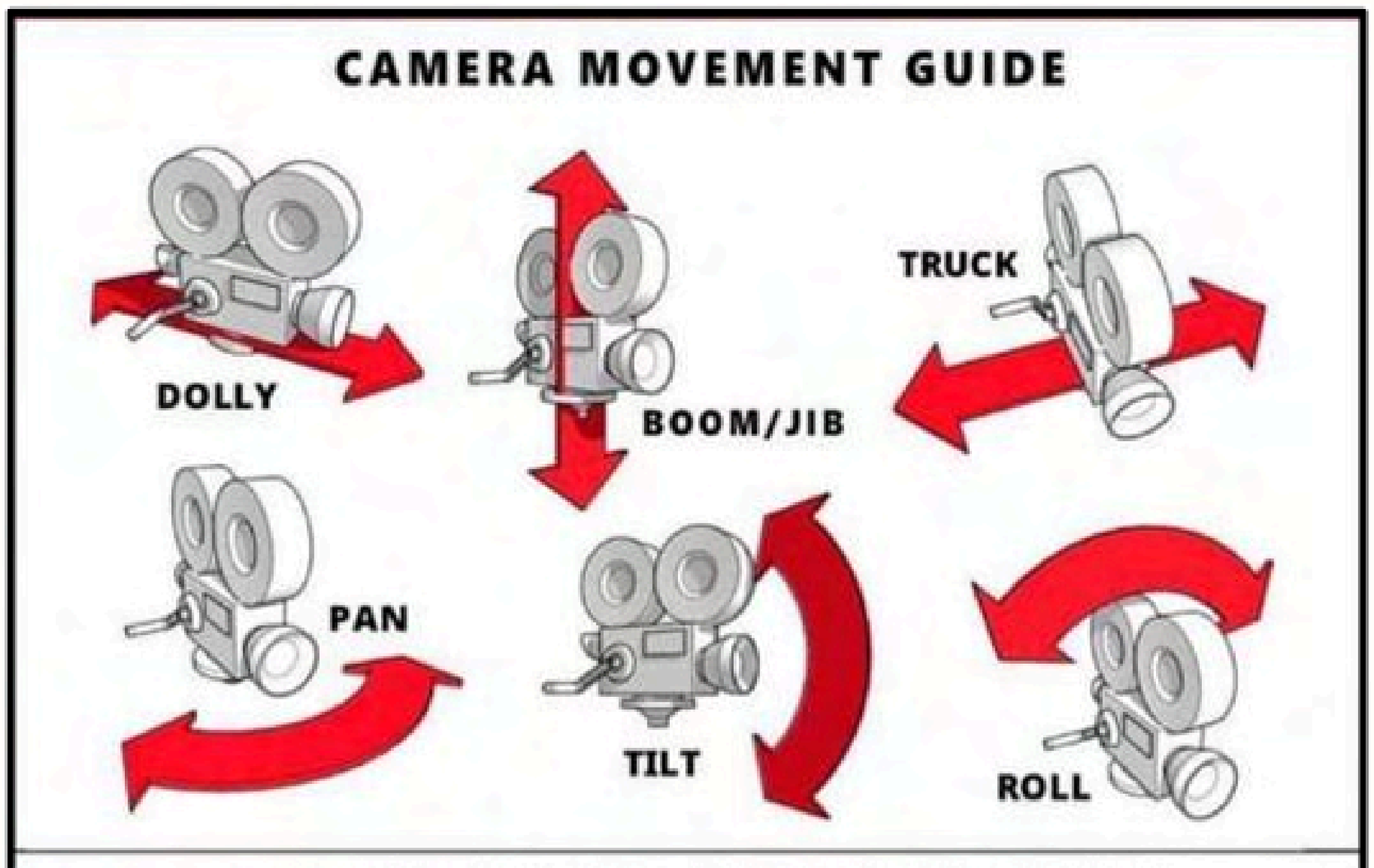
Used to express awe or emphasis, or follow a subject's movement vertically.

Photograph made during the project “Shoot for the future”

Roll

A camera roll is a rotational camera movement that rotates the camera over its side.

Rolls can be dizzy for the spectator and unnatural, It’s mostly used to disorient or create uneasiness (studiobinder.com, 05/05/2024).



References:

https://www.streamsemester.com/articles/9-basic-camera-moves

Summary

This guidebook equips you, the aspiring videographer, with the technical knowledge to control the look and feel of your photos and videos. By understanding fundamental camera settings and their impact, you'll gain the ability to capture stunning visuals and elevate your storytelling.

Diving deeper into image creation:

Exposure triangle: We'll explore the three pillars of exposure: Aperture (F-stop), Shutter Speed, and ISO. Master these settings to control brightness, depth of field (background blur), and image noise.

Dynamic range: Learn how to capture scenes with contrasting light and shadows without losing detail.

White balance: Achieve natural-looking colours by understanding how white balance settings adapt your camera to different lighting conditions.

The power of lenses: Discover the impact of focal length on perspective and composition. Explore different lens types for achieving wide shots, telephoto close-ups, and creative effects.

Frame rate (FPS): Grasp the concept of frame rate and its influence on the smoothness and slow-motion capabilities of your videos.

Camera Movement: Unlock the potential of tripods for creating stable shots, smooth pans, and dynamic tilts.

Beyond the basics: This guidebook provides in-depth explanations, clear illustrations, and practical exercises to solidify your understanding. With this knowledge, you'll be well-equipped to translate your creative vision into captivating videos.

Ready to take your videography skills to the next level? Let's begin!

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