

**A BRIEF  
BUT DETAILED  
EXPLANATION  
OF THINGS I TRY TO  
REMEMBER WHEN  
RECORDING AND  
EDITING VIDEOS  
AND STUFF THATS  
GENERALLY JUST  
GOOD TO KNOW  
RELATING TO  
VIDEO**



4:4:4



## CHROMA SUBSAMPLING

To save storage space when recording video, cameras will often reduce the colour (chroma) resolution while keeping the light (luma) resolution intact.

This is referred to as chroma subsampling.

Although there are different amounts of chroma subsampling, most consumer cameras record at 4:2:0, which means only a quarter of the colour resolution is recorded. For a video recorded at 1920x1080p, the colour resolution would be 960x540p.

Chroma subsampling is often visible in videos, as some parts of the video may be pixelated while others may not.



4:2:0



To eliminate chroma subsampling, a video can be downsampled to a quarter of its original size.

This ensures that every pixel of the downsampled video has both light and colour information. As a result, the image appears sharper.



## FRAME RATE

A video's frame rate depicts how many frames there are in a second of video, or to put it another way, how often the video 'refreshes' or 'updates'.

A videographer may decide to use a different frame rate depending on the type of video they plan on producing. For example, a stop-motion video may use a frame rate of 12 frames per second, while a feature film may use a frame rate of 24 frames per second, as this has become the standard that's been used for decades.

The highest frame rate a screen is capable of producing is directly determined by its refresh rate.





As most computer monitors and smartphones in New Zealand have a maximum refresh rate of 60Hz, they can refresh up to 60 times per second, and can therefore display content with a frame rate of 60fps. A video that has a higher frame rate can still be displayed, but some frames will not show.



# SHUTTER ANGLE

Videos can have various shutter speeds. The shutter speed of each frame is measured in fractions of a second, just like when taking a photo.

When a slow shutter speed is used, there will be more motion blur in the video. When a high shutter speed is used, less motion blur will be present in each frame, allowing the viewer to more clearly detect the presence of subjects.

The shutter angle depicts the shutter speed's relation to the video's frame rate, and is measured in degrees. Picture a circle. A circle has 360 degrees. If the shutter speed is double the frame rate, then the shutter angle is 180 degrees, which can be drawn as a half-circle.



Camera's don't allow a shutter speed lower than the set frame rate, meaning the maximum shutter angle is 360 degrees. However, the shutter angle can be artificially increased in video editing software via the use of motion blur effects.

For most videos, a shutter angle of 180 degrees is recommended to achieve a cinematic look.





## RESOLUTION

Resolution is usually the first thing that comes to mind when one thinks of the technical aspects of video. The resolution is measured in horizontal and vertical pixels.

The more pixels there are in a video's frames, the sharper the image.

Not only does a higher resolution mean the video can be downscaled to an acceptable size to eliminate chroma subsampling, but it also means that video editing software has more information to work with. Many effects will work better as a result.





For starters, the Warp Stabiliser effects found in Adobe After Effects and Premiere Pro tracks objects better, as objects consist of more pixels than a lower resolution video.

The Unsharp Mask effects also performs better, as its sole purpose is to increase the contrast between edges.

Finally, a higher resolution allows for more cropping. This is very useful when a videographer wishes they had used a higher focal length when recording, as they can simply scale the video according to their desires. For example, an 8K resolution video exported at 1080p can be cropped up to 400% before undesirable upscaling side effects are introduced.



## ASPECT RATIO

A video's aspect ratio relates to the 'shape' of the video, and can contribute to the style or type of video the videographer is trying to replicate.

Most computer screens and smartphones use an aspect ratio of 16:9, which means the width of the video is 1.778 times the height. This became the standard around 2008; before then the standard was 5:4, which was more of a square shape.

In the old days, films commonly used a 4:3 aspect ratio, but eventually the industry standard became wider, meaning nowadays films are often recorded in a 16:9 or 2.39:1 aspect ratio.



This works well for scenes with a lot of action, as it means more can fit horizontally in the frame. As human eyes are positioned side by side, we naturally receive more information horizontally than vertically. This is why videos are typically wider than they are tall.