DUNGEON FROG Studios

# CINEMATOGRAPHY 101



The Film & TV Educators Network

# EXPOSURE

Exposure is the amount of light that your camera's sensor can see and impacts how bright, or dark, your desired image appears.

It's one of the most important elements to consider when shooting, and has technical implications and creative ones.

If you incorrectly expose your image, it will appear either too dark, or too bright, and you could lose information in your image!

# EXPOSURE



# EXPOSURE

Notice how the cliffs in the underexposed example lose detail?



# EXPOSURE




...and how the sky is completely blown out and lacking colour in the overexposed example?

# EXPOSURE




Generally we want to keep as much visual information as possible, and that means correct exposure.

So how do we do that?



# EXPOSURE

Other than adding additional lighting (which isn't always possible) there are actually a few things we can adjust on the camera side to control exposure:

## APERTURE

## SHUTTER SPEED

## ISO

# APERTURE

Aperture refers to the opening in the lens through which light passes.

The wider the aperture, the more light the sensor can see.

The narrower the aperture – the less.

# APERTURE





It's similar to the way that the pupil of your eye works. In the dark, your pupil will dilate to let in more light, while in direct sunlight it will constrict.

# APERTURE

To adjust the aperture of our lens, we use our iris controls.

On cine and manual lenses this is a ring on the outside of the lens or, for electronically controlled stills lenses, a dial on the camera body.

If shooting on a mobile phone or tablet, the lens will usually have a fixed aperture which cannot be adjusted.



# APERTURE

Lets look at a manual lens!

This is a manual zoom lens, so it has three rings...




But what do the numbers mean?

# APERTURE

Aperture is measured in stops

A single stop is a doubling, or halving of light




The smaller the number, the wider the aperture and the more light hits the sensor, and vice versa

# APERTURE

Stills lenses tend to have ‘clicked’ iris rings.

This means you can’t smoothly adjust the aperture between stops, as they will click between 1/3 of a stop increments




Lenses designed specifically for video work have ‘declicked’ iris rings which allow for smooth adjustment between stops

# APERTURE

So why do we have multiple tools for exposure adjustment if we can just adjust our aperture?

Well, every exposure tool at our disposal also has secondary effects.

In the case of aperture/iris adjustment, it also effects something known Depth of Field (DoF).

# APERTURE

But before we touch on that, lets look at our other two exposure tools!

## SHUTTER SPEED

## ISO

# SHUTTER SPEED

Your shutter speed controls how long light is allowed to hit the sensor before a frame is exposed.

The longer the exposure time, the brighter the image, the shorter the exposure time, the darker.

It's usually measured in fractions of a second (or seconds for long exposures) or shutter angle.

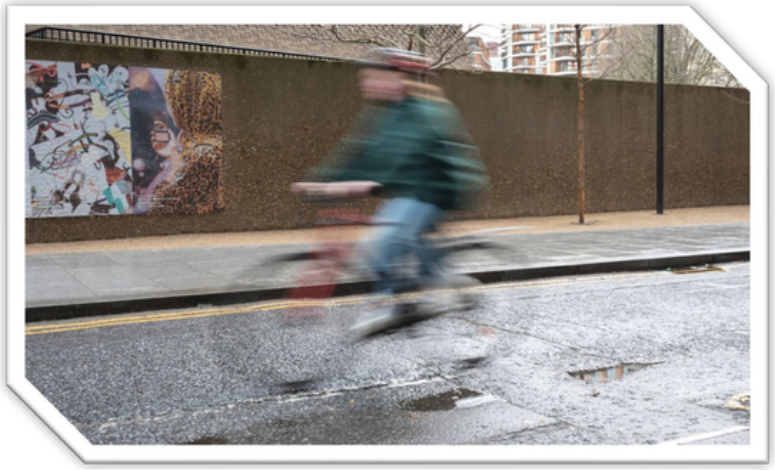
# SHUTTER SPEED

Shutter speed is a less common exposure adjustment when shooting video, due to its secondary impact

## MOTION BLUR

While shutter speed has an impact on exposure, it also affects the appearance of motion.

# SHUTTER SPEED







SLOWER ← → FASTER

In this example the cyclist is moving past the static camera

Notice how as the shutter speed increases, the cyclist becomes less blurred

# SHUTTER SPEED

Most of the time when shooting, we want to maintain a natural appearance of motion.

This can be achieved by taking your framerate, and doubling it to get your shutter speed.

So, for example, if shooting at 25fps, your shutter would be 1/50, whereas if shooting at 100fps, it would be 1/200

But shooting at a non-standard shutter speed can be a desirable creative choice...

# SHUTTER SPEED

High shutter speed is often used to evoke a certain mood, as less motion blur means action appears faster and more chaotic.



The Omaha Beach sequence in Saving Private Ryan is an excellent example of a high shutter speed being used to simulate shellshock

# SHUTTER SPEED

Conversely,low shutter speeds are often used to evoke a more dreamlike/surreal feeling, with motion feeling slow and fuzzy.



This sequence from Wolf of Wall Street uses this to show the character experiencing the effect of drugs

# SHUTTER SPEED

So, while shutter speed can be used as an exposure tool (especially for photography) for moving images it tends to be used predominantly as a creative tool

In that case, what about our third option for exposure control?

# ISO

Your ISO setting dictates the sensitivity of your camera to light

Higher ISO means higher sensitivity and a brighter image

Lower ISO means lower sensitivity and a darker image

# ISO

So what are the caveats to ISO?

## NOISE

## DYNAMIC RANGE

# ISO

By increasing yourISOtoomuchyou can introduce noise into your image







This is because you're boosting the sensitivity of your sensor and exaggerating pre-existing noise in the image

# ISO

So just keep your ISO as low as possible, right?

Not necessarily, because we need to consider

**DYNAMIC RANGE**

# ISO

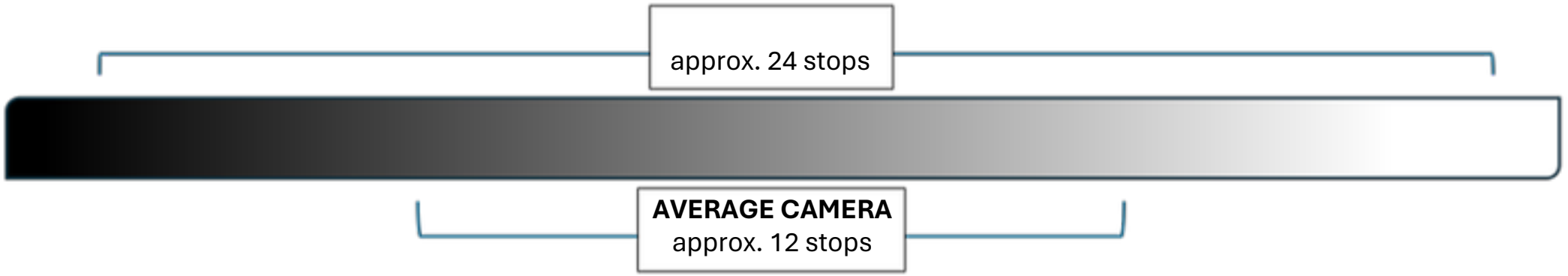
Dynamic range is the range of exposure your camera can resolve detail at

A wider dynamic range means a camera can see more information in the darkest and brightest areas

# ISO

Dynamic range (DR) is measured in stops, with the number of stops retaining visual information being its range

**HUMAN EYE**




The average human eye can see approximately 24 stops of information, while an average camera can see around 12

Even the best cameras can't match the human eye for DR!

# ISO

Every camera has a native ISO
(or in some cameras, 2 or 3 native ISOs)

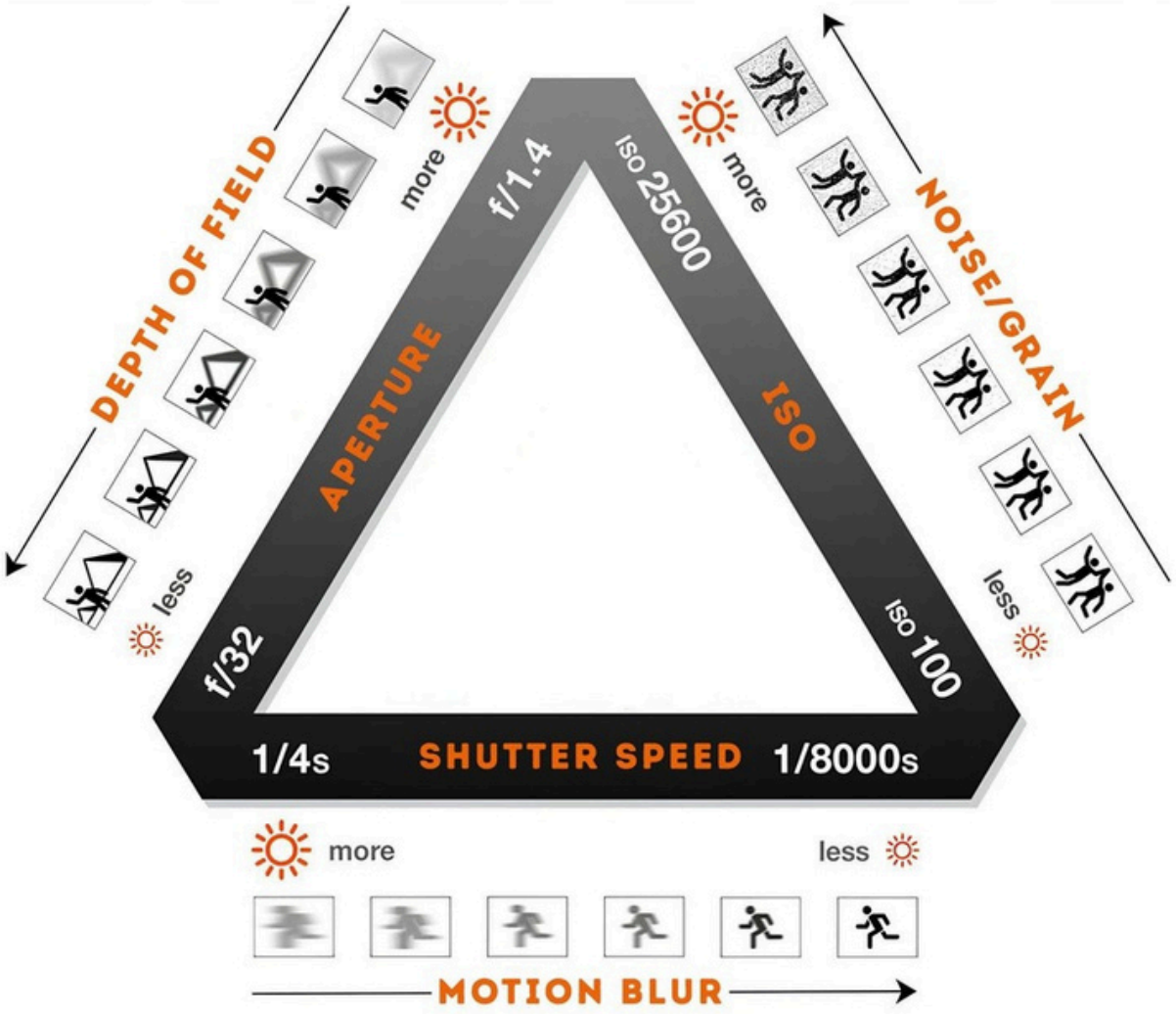
The native ISO of a camera is the sensitivity at which it produces the widest or most balanced dynamic range

If you veer too far from your camera's native ISO, the dynamic range of the camera will become narrower

# EXPOSURE

All of that information might be a little overwhelming, but there's an easy way to remember what does what with the

# EXPOSURE TRIANGLE



# WHITE BALANCE

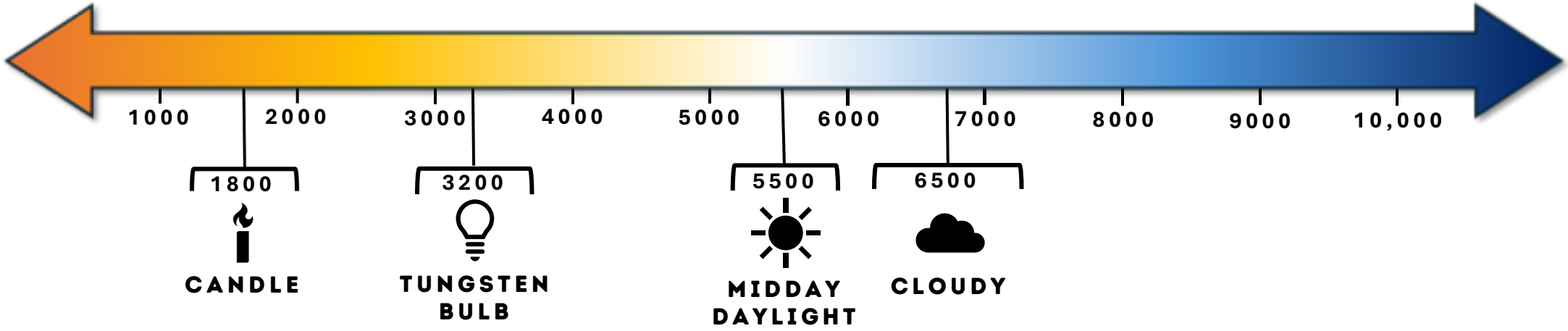
White balance adjusts the temperature of your image so that whites appear neutral



If you set it incorrectly your image will appear too cool or too warm, and may have a nasty colour cast

# WHITE BALANCE

White balance uses the Kelvin scale for temperature, some common temperatures are listed below




You can also use auto white balance (AWB). This isn't ideal for all scenarios, as it can cause unnatural shifts during filming, but can be useful for run & gun documentary

# DEPTH OF FIELD



Depth of Field refers to the range wherein objects appear sharp within an image

A shallow depth of field means only a small area of the image will be in focus

A wide depth of field means a wide area of the image will be in focus



# DEPTH OF FIELD

Depth of field (DoF) can be impacted by multiple things:

## APERTURE

Wider apertures mean shallower DoF

Narrower apertures mean deeper DoF

## LENS FOCAL LENGTH

Longer lenses will have shallower DoF*when at the same camera-subject distance as wider lenses*

## CAMERA-SUBJECT DISTANCE

The closer the subject is to the camera, the shallower the DoF

This is why macro photos often have very shallow DoF

## SENSOR SIZE

Bigger camera sensors appear to have shallower DoF*at the equivalent field of view* (FoV) to smaller sensors

This is due to needing longer focal lengths to match the FoV of the smaller sensor

# FRAMING

Two of the most fundamental aspects of cinematography are framing & lighting

Framing, just like it sounds, defines the window through which viewers will experience a story

It's your shot choices and image composition, the fundamental visual building blocks of storytelling

# FRAMING

Framing can be used to evoke specific feelings in an audience



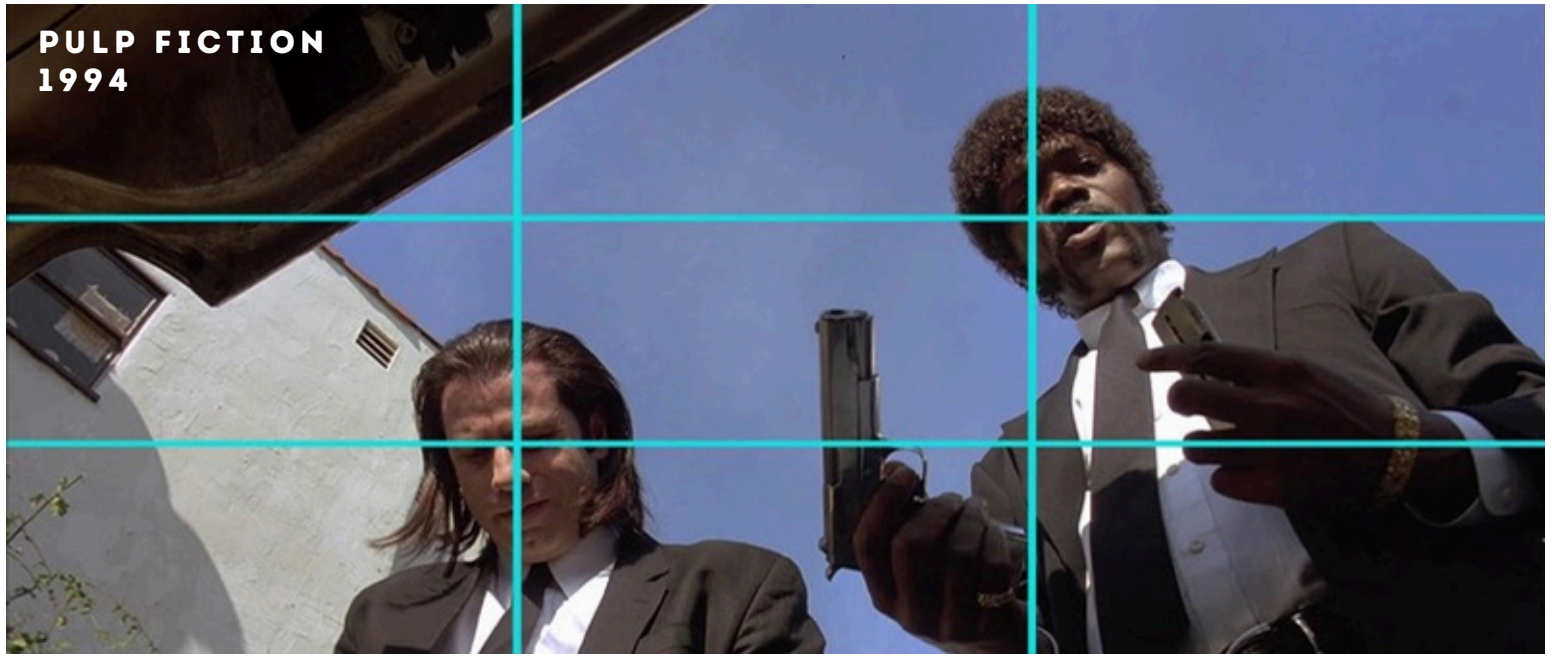

From a sense of scale




To a sense of unease

# FRAMING

One of the most simple, and useful, tools for guiding your framing is the



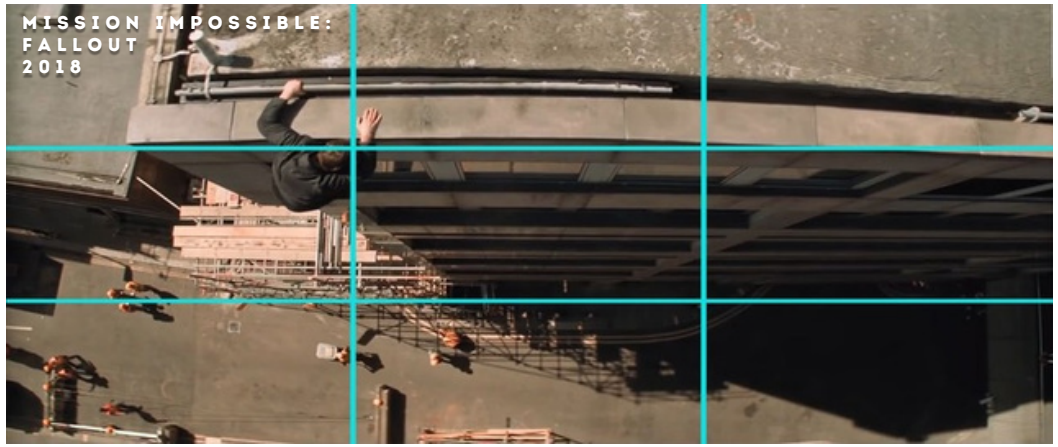

## RULE OF THIRDS

# FRAMING

Despite the name, the rule of thirds isn't a hard rule, but it is a good starting point for experimenting with composition




When shooting people you might line them up with the vertical lines, with their eyes falling on the horizontal lines




Or for special emphasis, as in this example which balances the roof of a building, it's side, and the ground to emphasise height

# FRAMING

The rule of thirds is helpful, because it's a good starting point for framing as it encourages balance within images

It's useful for understanding composition but there are other techniques – and a lot of them can be combined

Let's take a look at a few!

# FRAMING

## FRAME WITHIN A FRAME

Whenyoursubjectis framedbyobjects
within your image

# FRAMING




This stark example from Apocalypse Now, immediately draws the eye and subconsciously evokes a sense of power in the character

# FRAMING




This doesn't have to be a literal frame, in this example Dustin Hoffman is framed by someone's leg

# FRAMING

## FRAME WITHIN A FRAME




It also doesn't mean you can't have other characters outside the frame. This example emphasizes the characters isolation even when surrounded by others

# FRAMING

## FRAME WITHIN A FRAME







Some films consciously make consistent use of framing techniques to evoke a certain mood or vibe

# FRAMING

## LEADING LINES

When your composition creates lines
leading towards the subject

# FRAMING

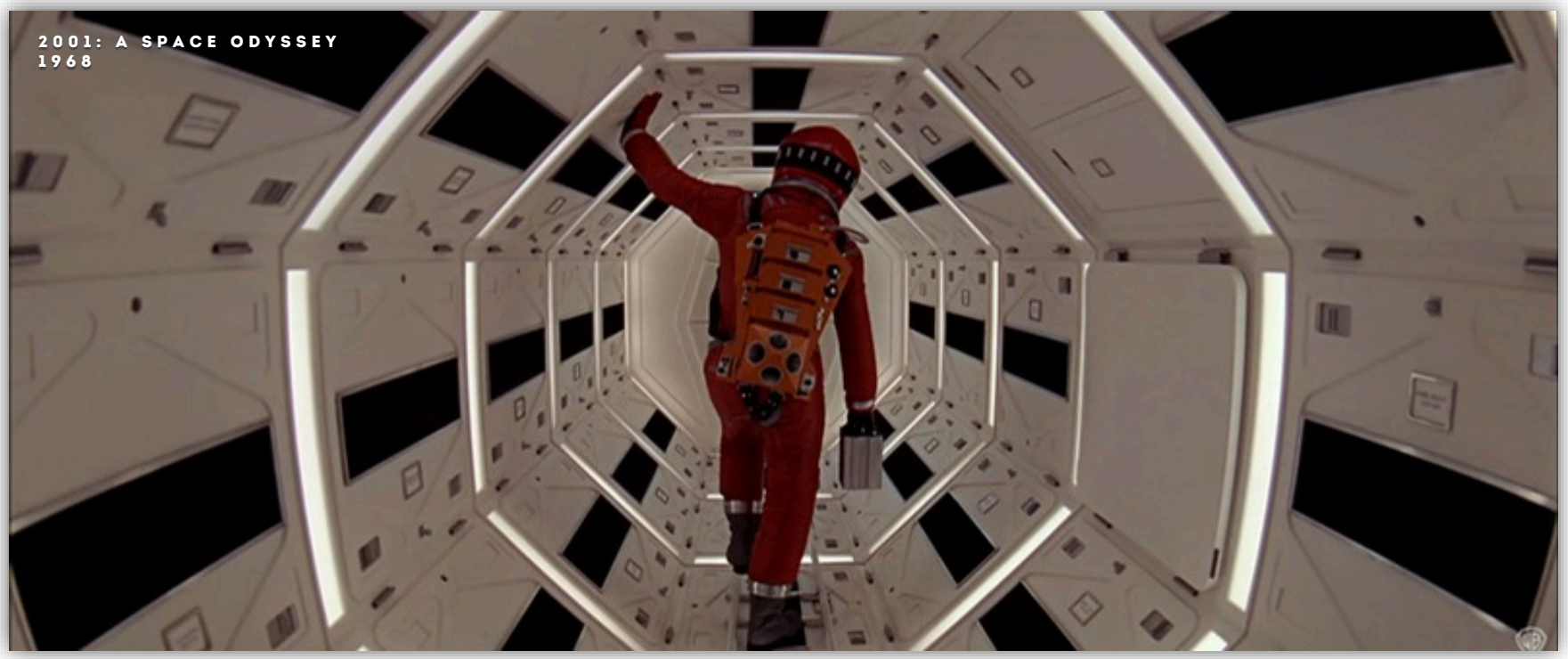
## LEADING LINES




This is a technique that was heavily utilised by Stanley Kubrick

# FRAMING

## LEADING LINES




It's effective at drawing the viewers attention in a specific direction or to a specific subject

# FRAMING

## LEADING LINES




Images can have multiple leading lines, coming from different directions as here – where you have lines coming from the floor and walls

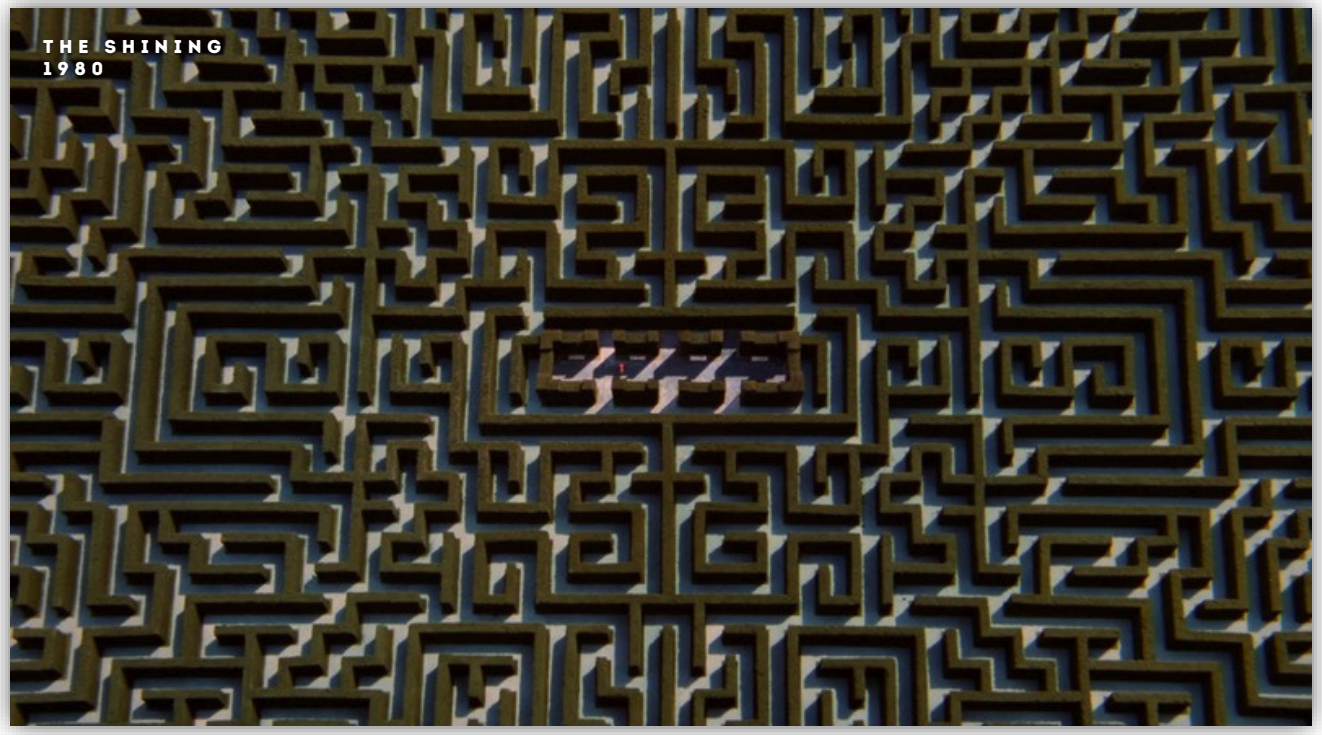
# FRAMING

## SYMMETRY

When yourcompositionishorizontally, or vertically symmetrical

# FRAMING

## SYMMETRY




Symmetry is also a powerful compositional tool, as it's naturally pleasing to the eye

# FRAMING

## SYMMETRY




You may have even noticed previous examples that exhibited symmetry in the other framing technique examples

# FRAMING

These are just a few examples of framing techniques, there are a lot more

As with most cinematography rules, once you understand the fundamentals and why they work, you can start to break them to evoke specific feelings



## DUTCH/CANTED ANGLE



## SHORT SIDED FRAMING

Claustrophobic andisolatestheviewerfrom thecharacter, goodforshowingparanoia



## CENTRAL SHOT-REVERSE

Emphasises theconnectionbetweentwo characters byhaving themoccupythesamespace inframe