

Green Screen video

Learn how to shoot a video on a green screen.

Læringsmål

Viden

Den studerende har viden om i erhvervet anvendte metoder og teorier til præsentation af data.

Færdigheder

Den studerende kan vurdere og behandle givet visuelt materiale til at sikre et konsistent udtryk i en digital medieproduktion.

Den studerende kan anvende og kombinere udtryksformer til design og produktion af digitale brugeroplevelser på udvalgte medieplatforme.

Introduction to Working with a Green Screen

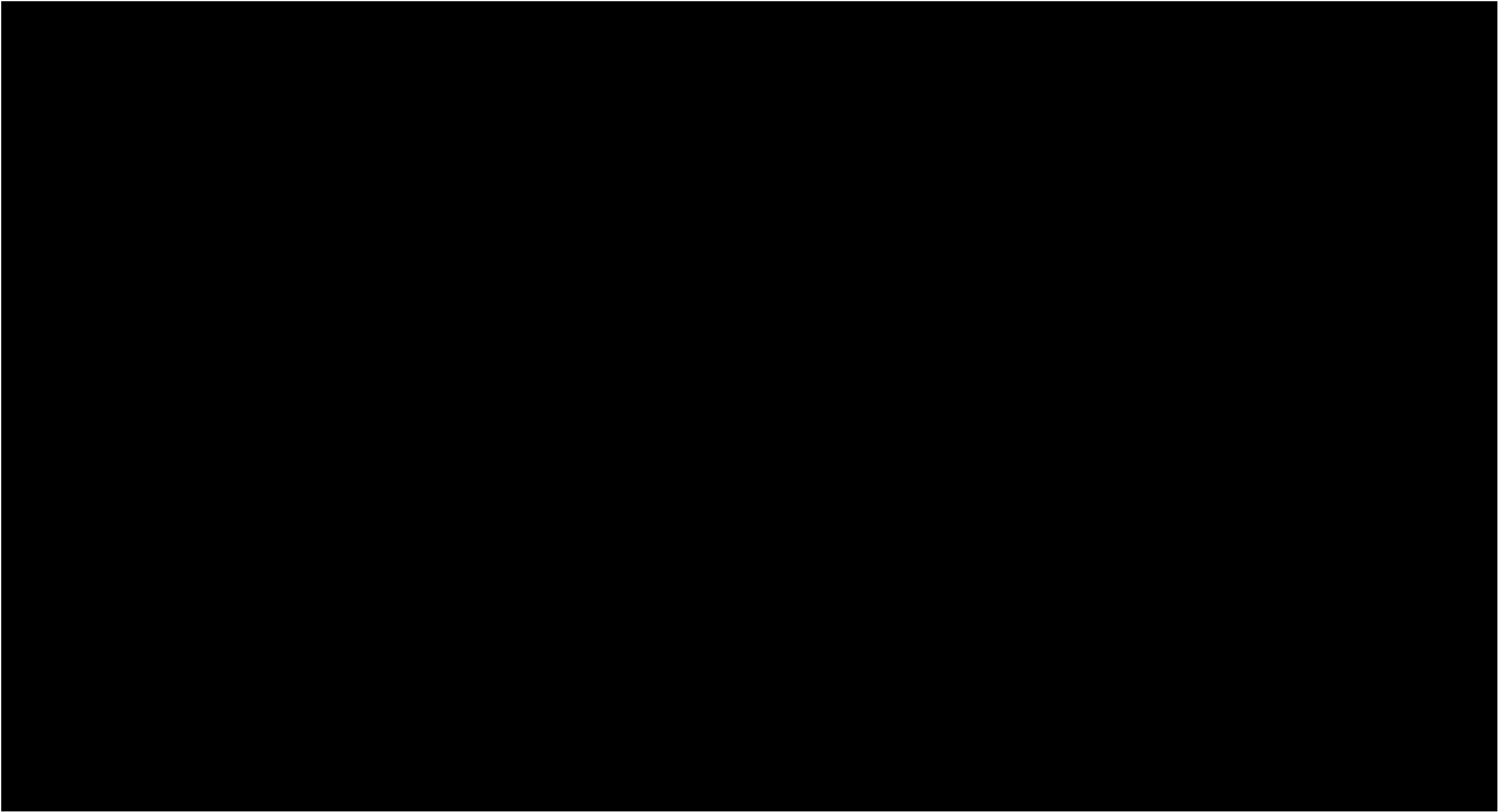
The **Chroma Keying** is a post-production technique where a colour (normally green) is digitally replaced by images/video streams:

- Any colour can be “**keyed**”
- For compositing (layering)
- All you need is a large room with adequate **lighting**
- flat and consistent painted, paper or fabric background

Working with a Green Screen

Topics

1. The History of compositing
2. Lighting Set up
3. Preparing for Post Production



1. The History of compositing

The “**Matte shot**” was one the first compositing techniques employed by early filmmakers:

- blacked out parts of the frame known as a “**matte**”
- no light would reach the film or get exposed
- By then rewinding the film and “matte out” of everything else
- only the expose the part of the frame get exposed
- This resulted a double exposure
- He could then combine two or more shots into one frame

1. The History of compositing

The very first motion pictures were, essentially a special effect:

- **Georges Méliès** was the first to experiment
- spent his life studying the art of illusion
- He used glass and black paint to cover an area
- Rewind the film and double expose it
- combining different shots
- He could add multiple elements into one image

1. The History of compositing

Méliès used this technique in 1898:

“Four Heads are better than one”

<https://youtu.be/RzsdqsiJQ6Y>



1. The History of compositing

This “matte” technique was used again in Edwin S. Porter’s - *“The Great Train Robbery”* in 1903:

<https://youtu.be/Bc7wWOmEGGY>

Watch this video and answer the question:

“Why didn’t they just shoot it in a real train station or a real train car?”



1. The History of compositing

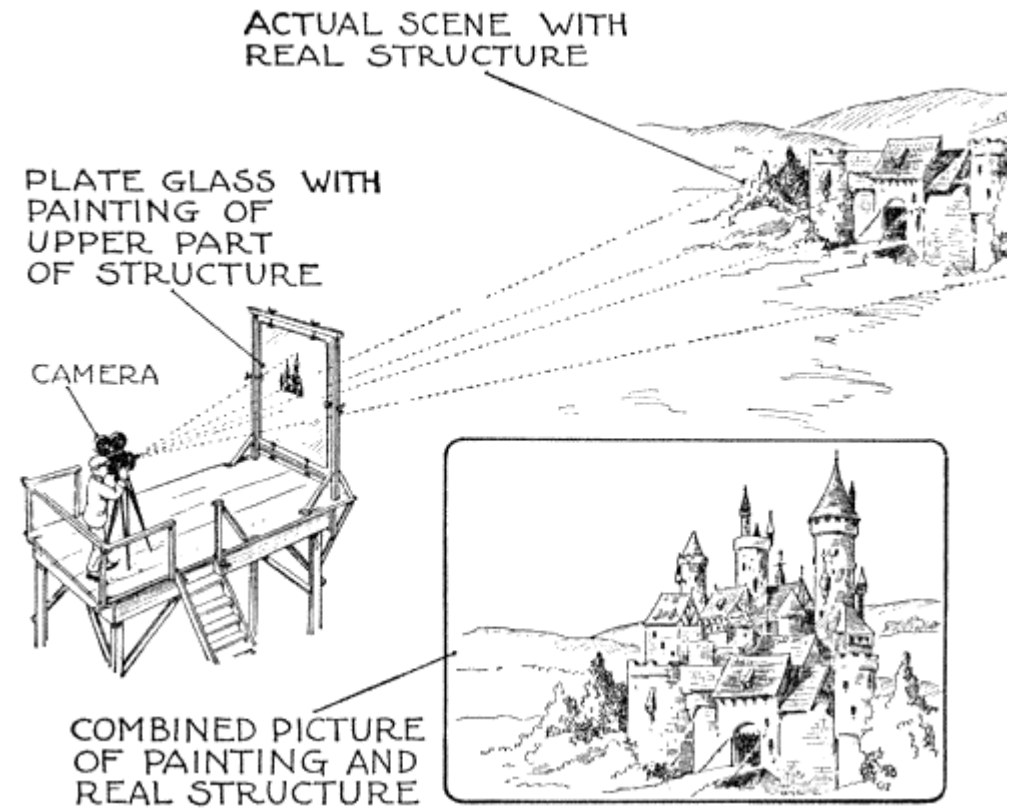
The answer: it was technically impossible at that time to shoot interiors and exteriors at the same time:

- Early film needed a lot of light
- efficient electrical lighting technology for film was still a decade or two away
- exposure problems when shooting interiors with windows
- Even modern day cameras have trouble
- All set lighting had to be controlled

1. The History of compositing

In the 1900s and 1910s **Norman Dawn** refined the technique known as the “**Glass shot**” :

- painting elements **on** a piece of glass
- placing that glass between the subject and the camera
- Made sets look bigger and more elaborate
- without the extra costs of construction



1. The History of compositing

The problem was **Paintings** had to be on set:

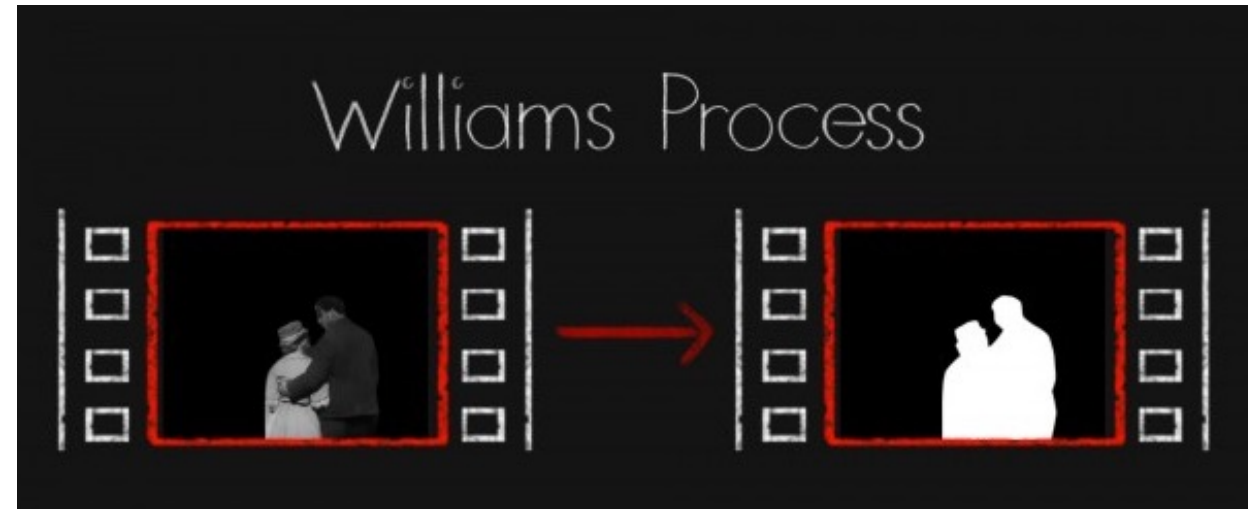
- Dawn used the matte shot technique
- Filmed the black painted glass
- matted film was transferred to a second camera
- matte artists could take their time creating paintings
- concept continued in the golden era of Hollywood and continues today



1. The History of compositing

The problem with **mattes** is the camera had to stay perfectly still and no action could cross the matte line:

- 1918 **Frank Williams** created the **traveling matte**
- Subjects were filmed against a black background
- The film would then be copied to high contrast negatives
- black and white silhouette emerged
- The silhouette was used as the matte



1. The History of compositing

In 1927 the **Williams Process** was used by F.W. Murnau in the film “*Sunrise*”:
<https://www.youtube.com/watch?v=6NayFytQeBE>

44:56



1. The History of compositing

It was made famously by **John P. Fulton** in 1933 for the film “The Invisible Man”:
<https://youtu.be/Y0WqgKOZi6M>



1. The History of compositing

The Williams Process had some issues because any shadows on the subject would be lost in the traveling matte:

- An alternative came about in 1925 using coloured lights
- **C. Dodge Dunning** invented the **Dunning Process**
- lighting a background screen blue
- foreground subject in yellow
- the blue and yellow could be split apart to create **traveling mattes**



1. The History of compositing

The Dunning Process was first use on “*King Kong*” in 1933: https://youtu.be/I8P7RzqOU_M



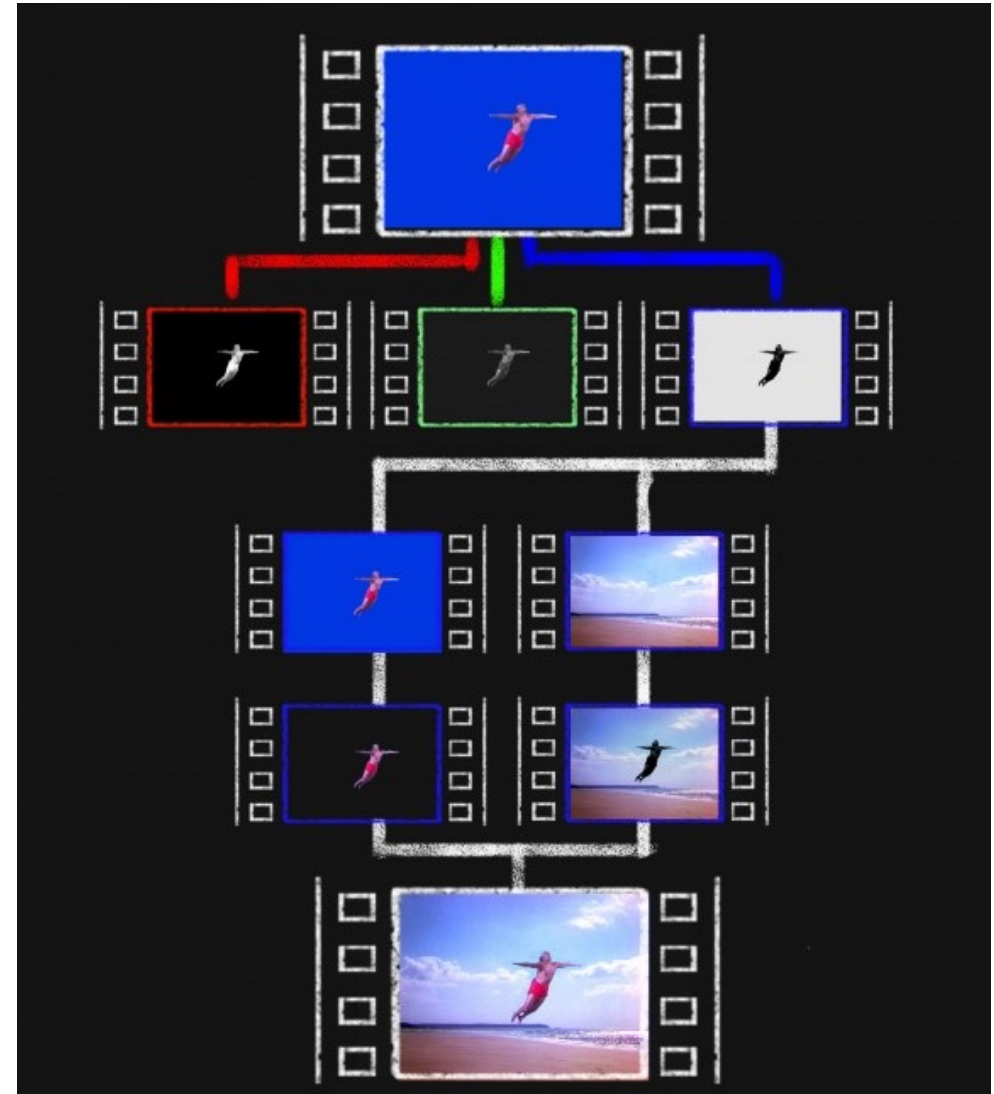
1. The History of compositing

The problem with the **Dunning Process** was it only worked with black and white film:

- Colour Film needed a new technique
- in 1940 by **Larry Butler** used the three **strip technicolor process**
- Butler shot the subject against a blue background
- the blue could be separated from the three technicolor negatives

1. The History of compositing

1. first remove the blue background from the foreground plate
2. using the negative of the travelling matte
3. remove the foreground space from the background plate
4. then combining both foreground and background plates together



1. The History of compositing

This bluescreen technique was not without its inherent problems:

- the process was extremely time consuming
- involved several steps with an optical printer
- it still had some edge issues where a thin blue line was almost always visible
- It also couldn't handle any fine details like hair or smoke

1. The History of compositing

The blue screen process was used in “*The Ten Commandments*” in 1956:

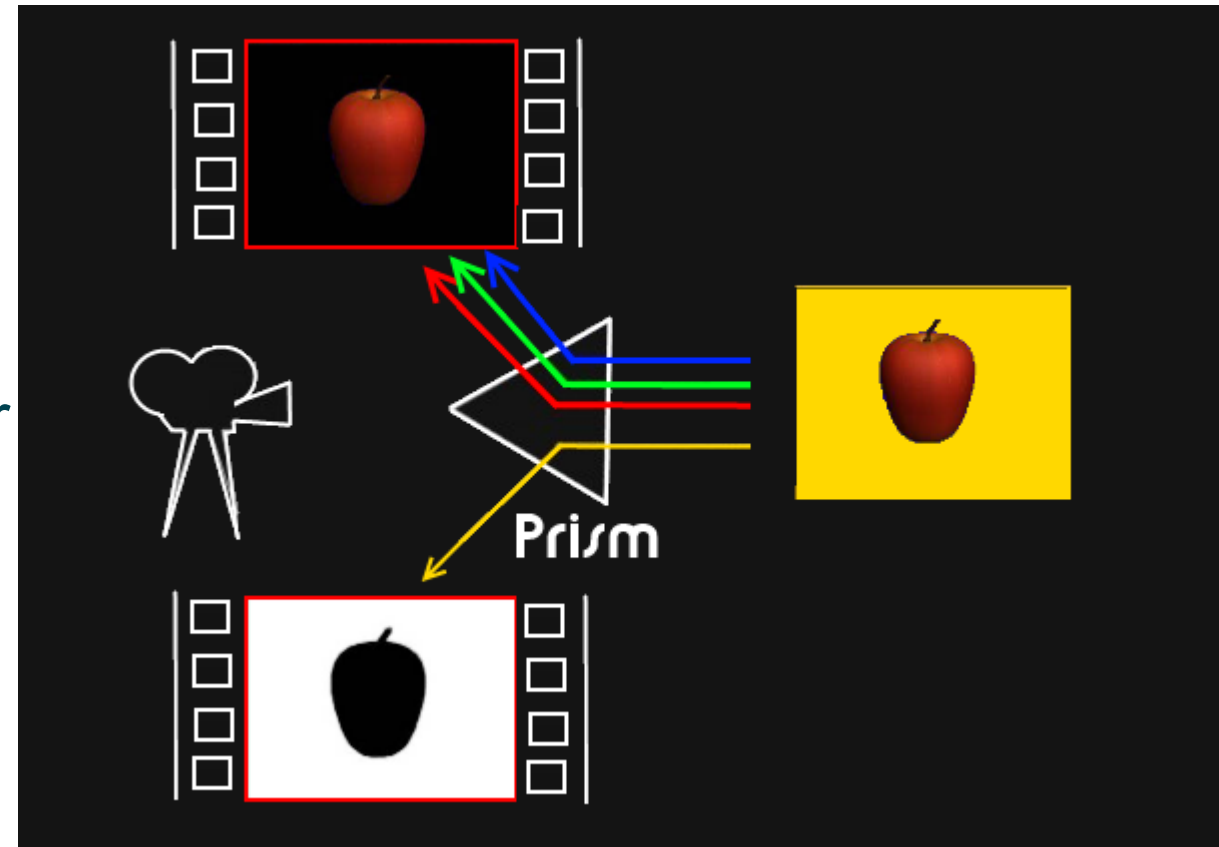
<https://youtu.be/OqCTq3EeDcY>



1. The History of compositing

Hollywood kept experimenting with other variations on the bluescreen process such as using an **ultraviolet matte**:

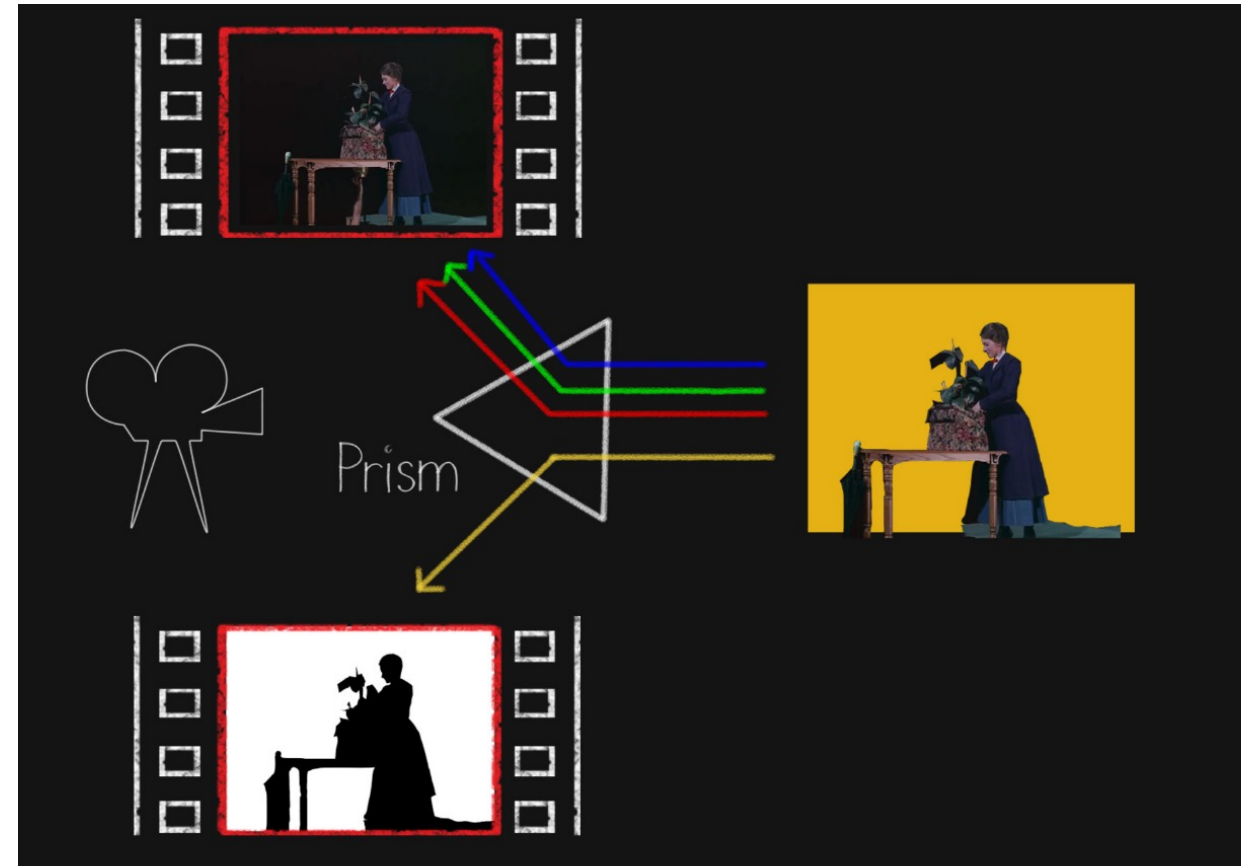
- In the mid 1950's **Petro Vlahos** developed a unique process
- Actors were lit normally standing in front of a white screen
- which was lit by powerful sodium vapour lights (orange street lights)
- Sodium vapour emits a very specific light wavelength



1. The History of compositing

Sodium vapour process was used extensively by **Walt Disney Studios** in the 60s and 70s:

- used a specially coated prism in an old three strip Technicolor camera
- the sodium vapour light was split off and captured on special black and white film
- The remaining light would be captured by regular three strip Technicolor Film which was relatively unaffected



1. The History of compositing

This technique produced some of the best **travelling mattes** of the time:

- “The Absent Minded Professor” in 1961: <https://youtu.be/oQ4-xxL0l9c>
- And “*Mary Poppins*” in 1964: <https://youtu.be/tRFHXMQP-QU>



1. The History of compositing

Disney owned the only Sodium Vapour prism ever made and the only, camera capable of the process:

- In the late 1950's MGM was ready to produce **Ben Hur**
- they asked **Petro Vlahos** to improve the bluescreen process
- After six months Vlahos had a discovery
- And this is where the story starts to get complicated..



1. The History of compositing

The process remained in popular use for almost 40 years, until the next big change when the process became digital:

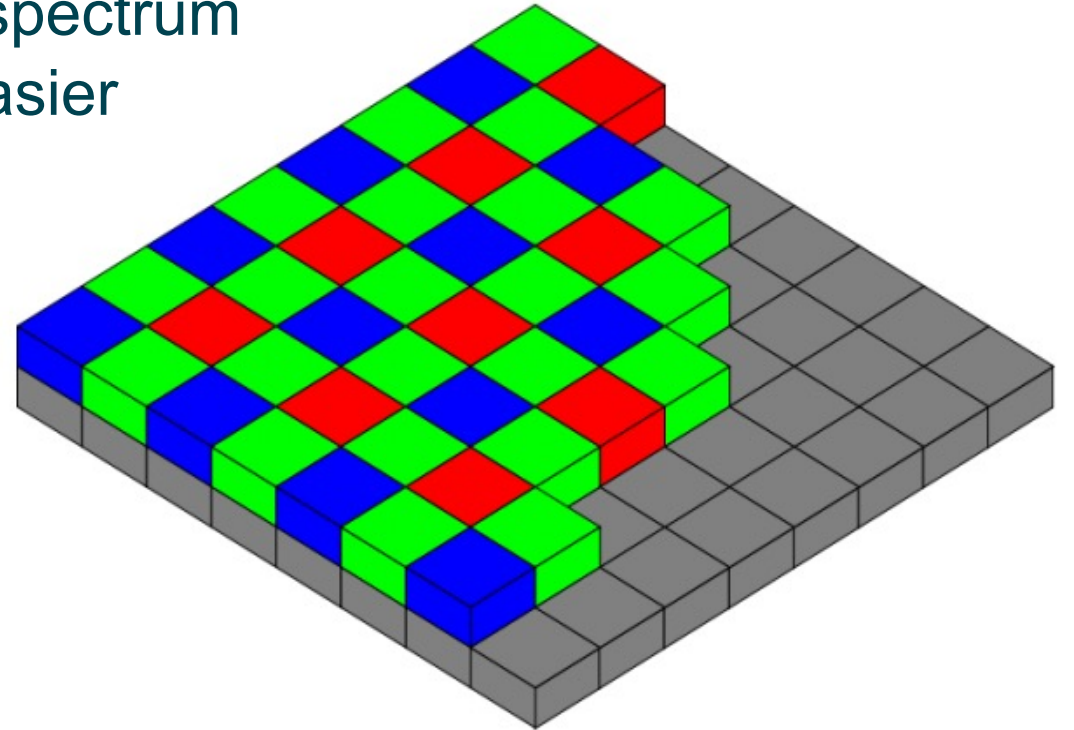
- Today the term “**chroma key**” is applied to video
- a **keyer** is a process that makes a range of colours in a video signal transparent
- In the 90's, green screens started taking over
- Green registers brighter on electronic displays, works better outdoors and is less common than blue



1. The History of compositing

Digital cameras began replacing film:

- many digital sensors that use a **Bayer Pattern**
- There are twice the number of green photosites than red or blue
- Green is a much more sensitive part of the spectrum
- makes pulling a **matte** from green screen easier



Guided Practice

In your groups, write or adapt a short script that you could act out and capture on a green screen:

- No longer than 1 minute in duration
- Any topic/situation of your choice
- Any location in the universe
- Any selection of music/sound effects
- No dialogue!

2. Lighting Set up

What type of **Screen** should you use green or blue, painted or fabric?:

- Blue is the traditional colour for film and is still used today
 - Sam Raimi's The Green Goblin vs. Spiderman
- But green is more sensitive to digital cameras and requires less light
- Any surface will do as long as it's flat/matte with no reflection or textures

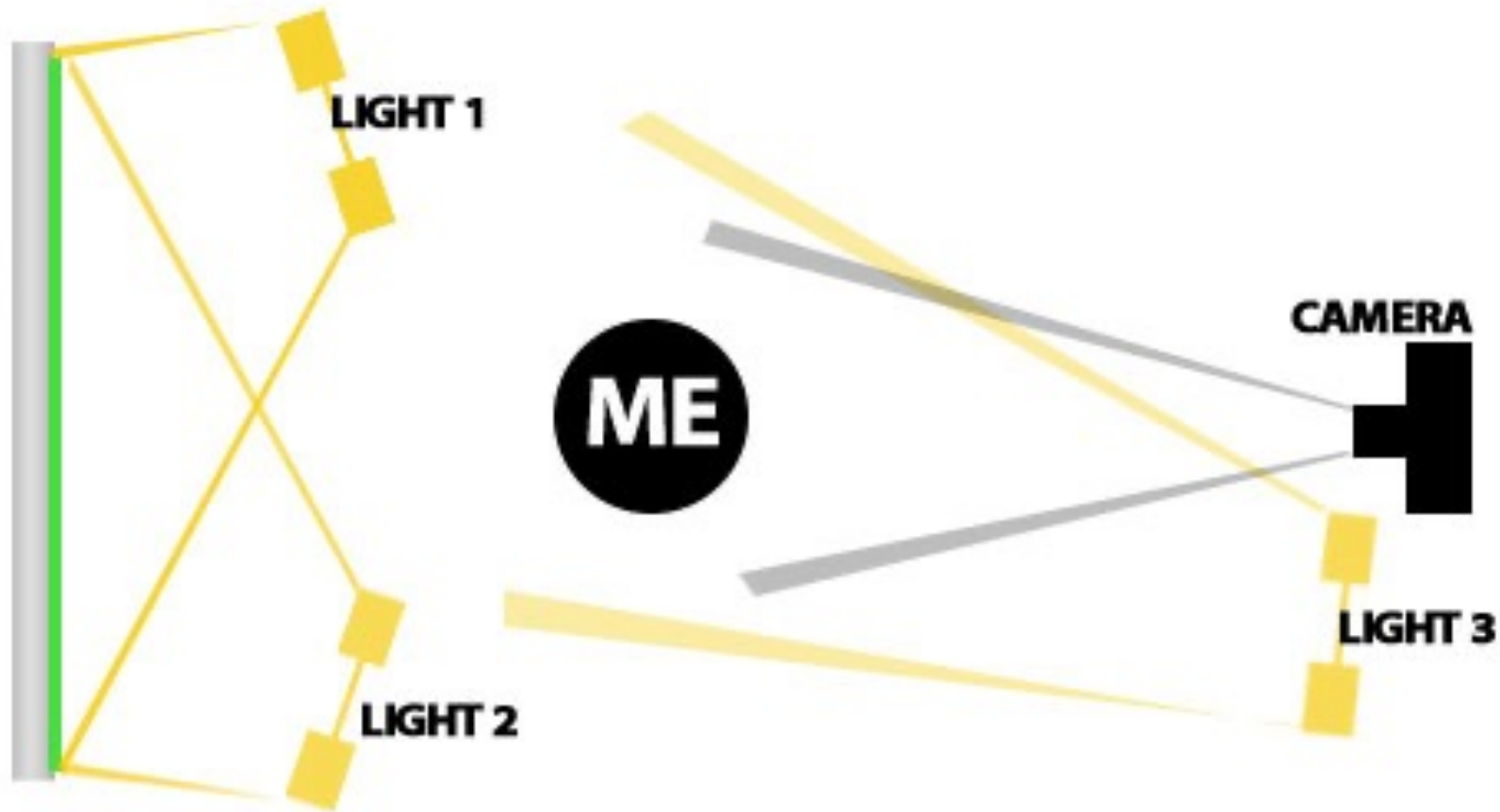
2. Lighting Set up

The single most important aspect to successful green screen photography is the arranging the lighting:

- We will be using the lights in the studio
- lights must be 1½ - 2 meters from the screen
- Positioned at a 45° angle towards the screen
- make sure your subject is not wearing anything green (Duh!)

2. Lighting Set up

Basic Green screen layout using 3 lights.



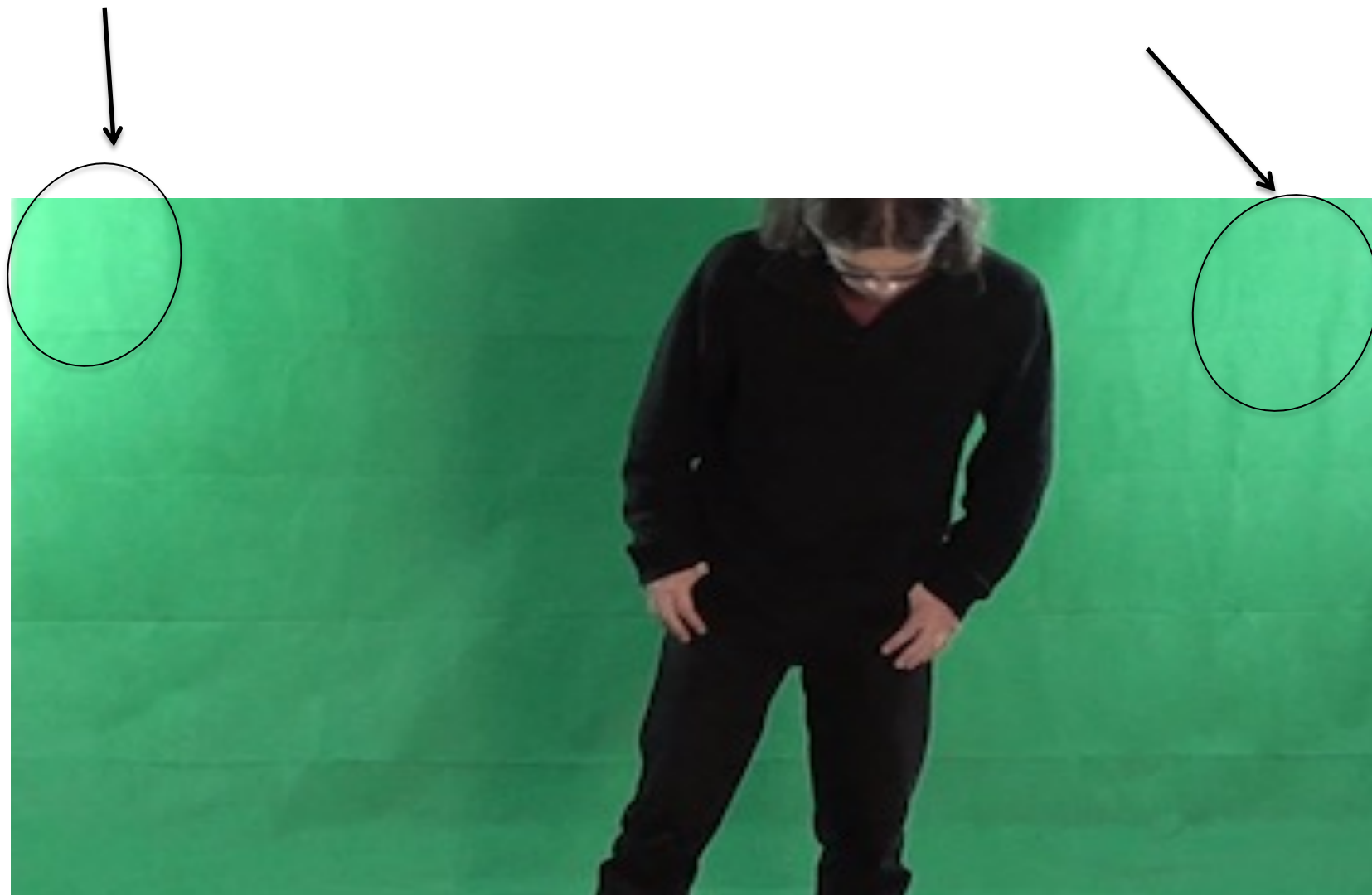
2. Lighting Set up

When **lighting** for keying, light the screen first and then the subject:

- combining the lighting could leave you with **shadows**
- This will make it more difficult to pulling a good key
- Start by getting a clean and even light on your screen
- Then light your subject
- Try to match the subject's lighting to that of the background
- Soft LED lights are more stable and won't change the colour in the camera

2. Lighting Set up

Avoiding Hot Spots



2. Lighting Set up

Now it's time to test your shot for **hot spots** in the camera's view finder:

- Place your fill lights between 1 -2 meters from the green screen
- Make sure there is even light across the whole screen
- Adjust thre fill lights to get the desired result
- Move lights closer to or farther away from the green screen
- As some lights get warmer, the screen colour will change
- Check the view finder again – rinse and repeat

When you satisfied shoot ten seconds of video

2. Lighting Set up

The first element in pulling off a key is the type of **Space** you have to work with:

- pull you subject away from the background far enough so that shadows don't fall on the screen
- Your subject will look natural and not distorted by a wide angle
- minimize the reflection of the screen on your subject
- With smaller spaces are reasonable talking head shot

2. Lighting Set up

Avoiding Shadows



2. Lighting Set up

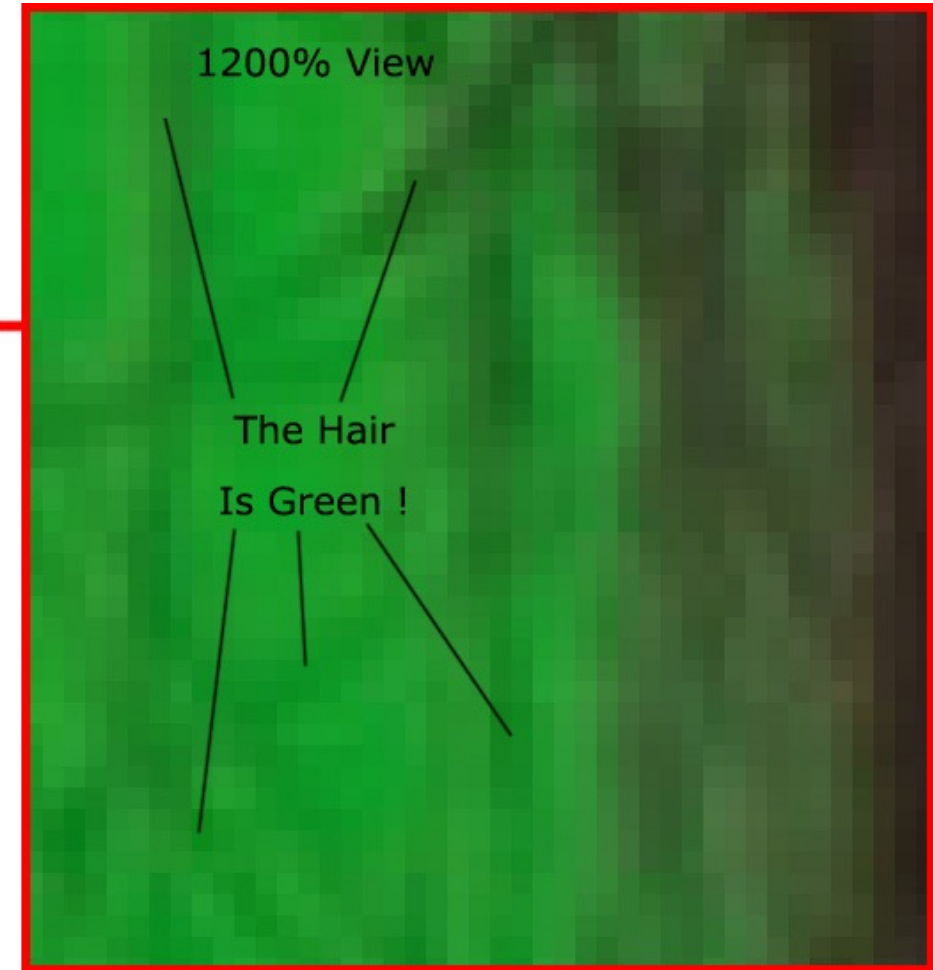
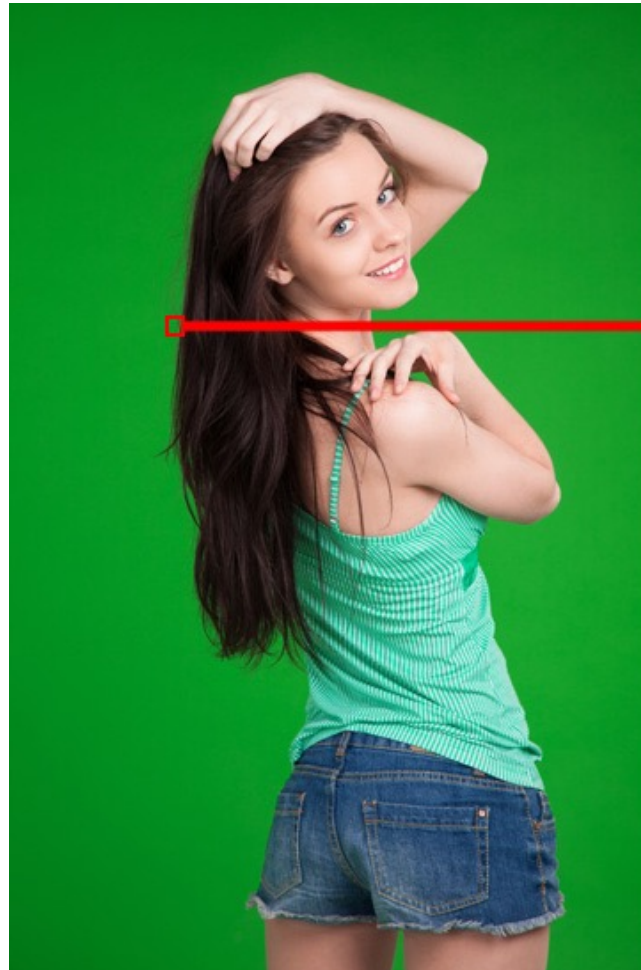
Now it's time to test your shot for **shadows** in the camera's view finder:

- Place your subject 2 meters from the background
- Position your camera for a full body shot
- Adjust the main light to get the best skin colours
- Check the view finder again – rinse and repeat
- Make sure there are no shadow cast upon the green screen
- Adjust thre fill lights to get the desired result

When you satisfied shoot ten seconds of video

2. Lighting Set up

Avoiding Green Spill, Halo and Bleeding



2. Lighting Set up

If your subject is too close to the green screen you are more likely to get “**green spill**”:

- This is a **green halo** *around* or **bleeding on** your subject
- Keep them in front of the fill lights
- Take off any reflective jewellery
- It can be extremely difficult (if not impossible) to remove during post production
- Keep you eye on the view finder
- insure that your subject remains within the frame

3. Preparing for Post Production

After you have captured your video you will need to transfer it to your PC.

- Raw Video and project files take up space on your PC
- so its best to store it on an external hard drive
- create a new folder on your hard drive and name it **Green Screen Project**
- create a new folder inside of it and name it **capture** or **footage** or **clips** etc...
- Move your video footage from the camera's SD Card

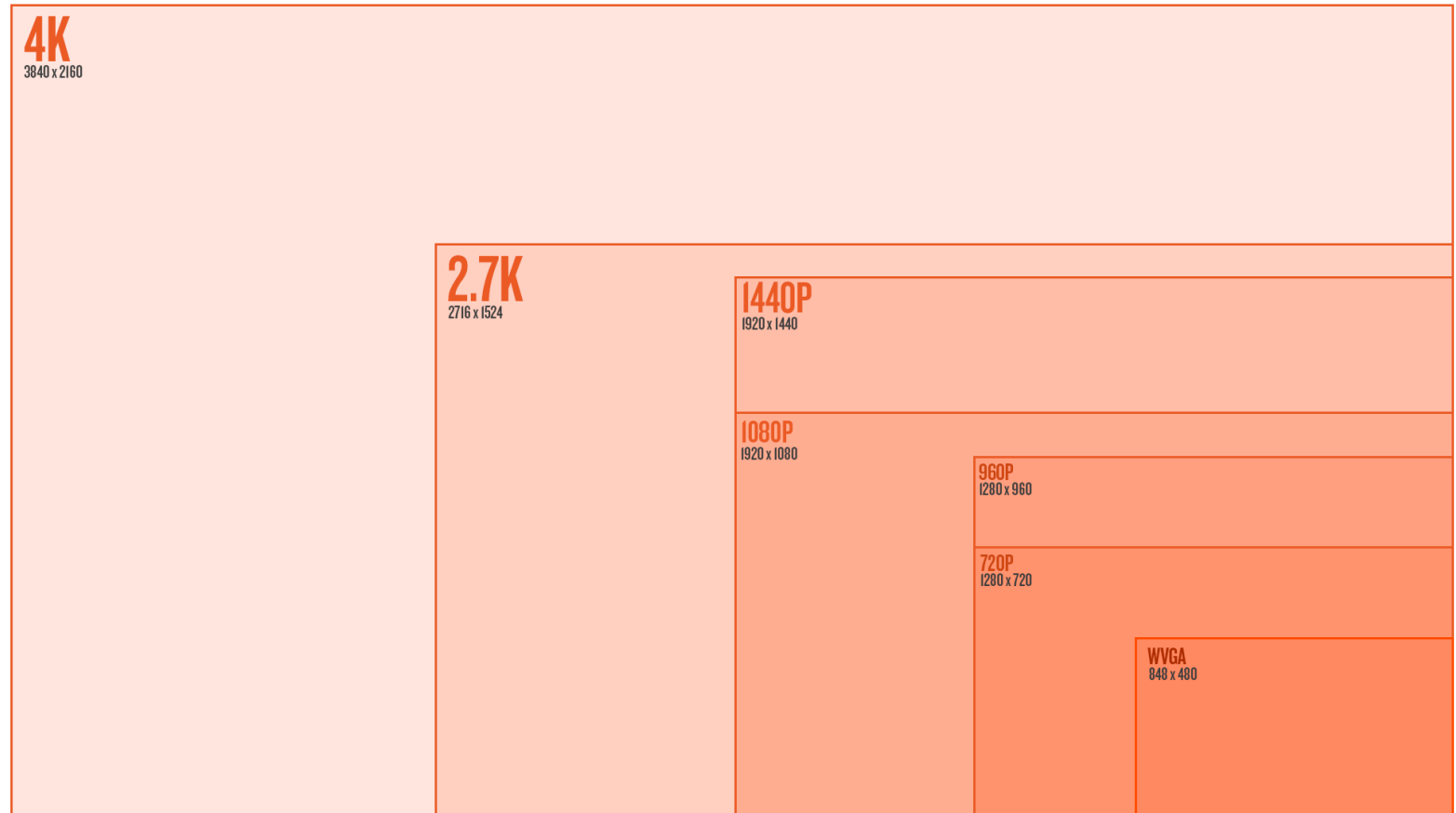
3. Preparing for Post Production

The type of camera **File Compression** can be a determine the quality of your keying:

- Cameras with higher the frame rates mean larger files
- Compressed video means the quality is being reduced
- Lower resolution video are more likely to have “**Spill**”
- Set your camera at the highest resolution possible
- Don't compress video before Importing it

3. Preparing for Post Production

The **Resolution** size will determine the picture quality:



3. Preparing for Post Production

The type of **Video** can determine the **File** quality:

- **HD** (4:2:2 compression) have smaller pixels and are easier to work with in Post

But make it easier to see spill, hotspots, shadows etc...

- **Full HD** (4:4:4 uncompressed) is the best
But are expensive and the files are huge

Working with a Green Screen

Summary

1. The History of compositing – the process of making an image area transparent and replacing it with another image
2. Lighting Set up – **1 main light** and **2 fill lights** avoiding **Hotspots**, **Shadows** and **Spill**
3. Preparing for Post Production – **File Compression, Resolution**

Independent Practice

In your groups, go to the studio and shoot the short script you wrote earlier on the green screen:

- No longer than 1 minute in duration
- Any topic/situation of your choice
- Any location in the universe
- Any selection of music/sound effects
- No dialogue!

Reflection

Use 5 - 10 minutes to review the **Subject** of today's lecture:

List the **Topics**:

- What do they mean to you?
- Which **Topic** was the most interesting and why?
- How can you begin to start working this knowledge?
- What new questions have arisen?
- What are you still wondering about?

Resources

Literature

- Foster, J, 2010. *The Green Screen Handbook: Real-World Production Techniques*. Sybex – Pp 161 - 171

Link: <http://goo.gl/S3TgnL>

Video

HOLLYWOOD'S HISTORY OF FAKING IT | THE EVOLUTION OF GREENSCREEN COMPOSITING

- <http://filmmakeriq.com/lessons/hollywoods-history-of-faking-it-the-evolution-of-greenscreen-compositing>