

PRODUCTION TECHNOLOGY'S

WORK BOOKLET

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LEARNING AIMS AND OUTCOMES

- Demonstrate a basic Knowledge and understanding of the processes used in Lighting, Sound and AV.
- Demonstrate competence in carrying out Lighting, Sound and AV tasks essential to good practice, and doing so in accordance with the health and safety procedures.
- Demonstrate basic knowledge and understanding of the processes involved in live and recorded sound.
- Demonstrate a firm theoretical foundation to their practical studies in Lighting, Sounds and AV.

LIGHTING EQUIPMENT

Lighting equipment has been used for centuries. Over time lighting equipment has evolved and has advanced a lot over the years, but to fully understand the origins of lighting equipment I will be going through the variety of different equipment that has been used.

Sunlight

The first theatre used natural sunlight as their source of light. It was the Greeks that were credited for the invention of theatre, they would build all types of performance spaces but they had to be complete before the afternoon sun so that it could shine through the audience and onto the stage creating a perfect bright illumination.



Candle

Back in the 1500s theatres had started to move indoors, because of this there needed to be another way to light the now performance room. Candles were placed all around the room in large chandeliers and sconces on walls. The candles were also placed on the floor (stage lights) and on every ladder or steps that would lead to the stage. The help increase the brightness of the candles and help provide focus towards the stage the use of reflectors had started to be used in the 1600s



LIGHTING EQUIPMENT



Oil Lamps

In the late 1708s a new type of light had been developed and become known as oil lamps. It uses a wick and vegetable or animal fat oil. Because oil was used the flame had to be enclosed in a cylindrical glass. Sometimes for theatrical effect the cylindrical glass would be coloured to change the mood of the lighting for certain scenes. Over time new improvements were made to the oil lamps as new designs and the use of Kerosene would increase the brightness of the lamps.

Gas Lamps

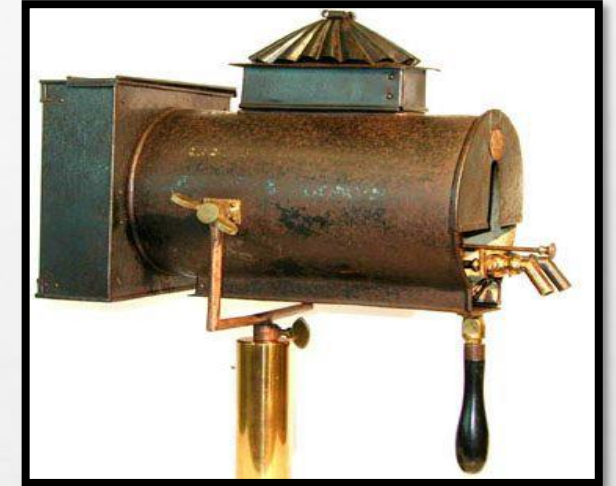
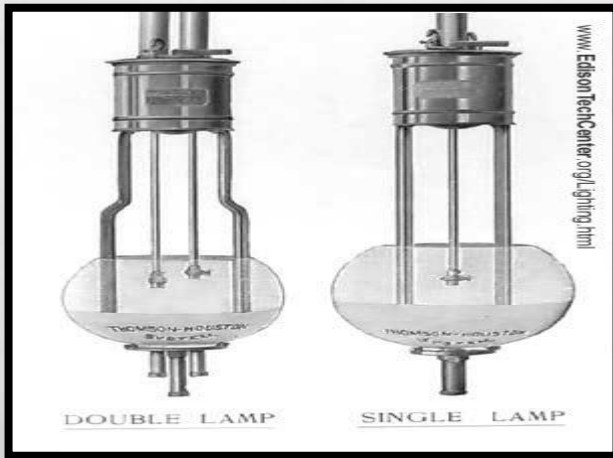
In the early 1800s theatres started to use gas controlled lighting. These lights work by feeding gas through pipes into burners which are placed on and off the stage. The light produced from gas lamps were significantly brighter than previous oil lamps which also allowed for a new level of control over the brightness of the lamps. By changing the amount of gas going in and out of each light the levels of illumination can be adjusted. This is the first time a stage light could be adjusted.



LIGHTING EQUIPMENT

Limelight

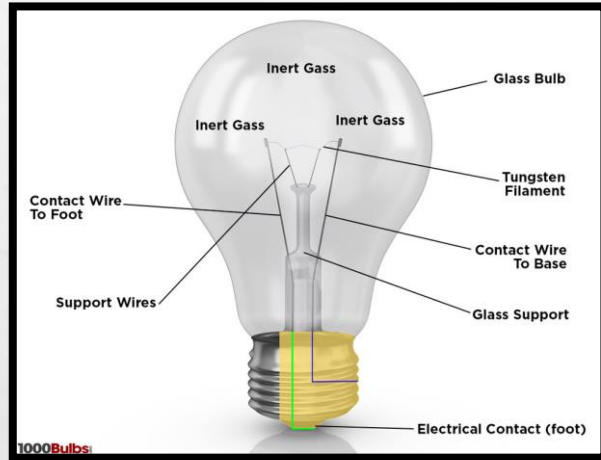
Limelight started to come into use in the late 1830s which became vastly popular throughout all theatres. A block of lime would be heated up until it became incandescent and it would emit an extremely bright light. This extremely bright light was normally placed in front of a reflector to help control the light emission. These types of light would also end up being placed around the auditorium which allowed uses such as front lights, follow spots, and even movement effects such as fire and water.



Carbon Arc

the was one of the earliest form of electrical lighting. It first appeared in 1846 at the Paris Opera. The use of a carbon arc helped recreate a beam of sunlight on stage. It produces light by using two carbon rods which are electrified together when touched. When pulled apart there can still be an electrical arc across the newly formed gap. The light that's produced is the carbon vapour being produced due to the two tips burning and heating up together.

LIGHTING EQUIPMENT



Incandescent Lamp

This light was invented back in the 1880s by a man called Thomas Eddison. This was the first incandescent bulb used in theatres. The next following years gas and limelight would be completely replaced with electric lights. Not only were these lights safe but they produced a much more sufficient light source. At first these lights used carbon filaments which were then later replaced with metallic filaments such as tungsten.

Tungsten Halogen

Tungsten halogen were introduced in the mid- 1960s, these types of bulbs used iodine or bromine inside the lamp which creates a chemical reaction and produces light. Due to this reaction it created a much brighter light being produced with a more consistent temperature and a much longer lifespan.



LIGHTING EQUIPMENT

High-Intensity Discharge (HID)

During the 1980s automated lighting started to come into play a lot more and the use of HID lamps as growing rapidly. HID lamps produce light by creating an electrical arc between two tungsten electrodes. The way the light is produced is a reaction with a mixture of different gas chemicals. When the chemicals are heated together they evaporate and form some sort of plasma, this can increase the intensity of the light.



Light Emitting Diode (LED)

This type of light was invented in the 1960s, they have recently taken over as one of the primary sources of light in all types of entertainment. In 2008 LED-based luminaries could be found on all sorts of stages world wide. An LED produces light by creating flowing electrons through a mixture of materials. Depending on the mixture of materials will determine the colour of the light being produced, for example by using a blue LED to excite phosphor it will create a white light. These types of lights are extremely energy efficient and have a very long lifespan. Due to these bulbs it has led the creation of many different types of lighting products such as strip lights.



LIGHT DESIGN

What is the purpose of Light Design?

- The main purpose of lighting design is to captivate and engage the audience through colour, texture, mood and energy.
- Light helps directs the audiences focus onto the stage.
- Lights enable the actors, scenery, action and all artistic elements to be seen on stage.
- Lighting is used for so much more than what people think, for example, lighting can create emotion depending on what light the lighting designer choses to make will depend on what mood the designer wants to make.

Functions of stage Lighting

Visibility – light helps the audience see the actors, the sets, the probs on stage.

Selective Focus – by directing the audiences attention lighting can illuminate specific areas/characters on stage.

Modelling – uses texture to emphasize or highlight shadows to make the things on stage as real as possible.

Mood – the use of colour to determine the different times of the day or to help resemble what moods the characters on stage are feeling.

Styles – realistic vs non-realistic

Information – the location, time, and space

LIGHTING FIXTURES

Ellipsoidal Reflector Spotlight (ERS)

- An **ERS** is an adjustable lens tube which contains a lens or lens train. By adjusting the tube lens by either pushing or pulling it further or closer it will allow the focus of the beam of light to change.
- These lights come in different sizes e.g. 15 deg, 26 deg, 36 deg, and 50 deg.
- These types of spotlights are normally used for front lights.
- 650W – 1000W or 375W – 750W depending on the power of light you want to use.
- These spotlights use shutters for added focus. There are also gobo and accessories slots.



Fresnel

- This type of stage lighting is a soft-edged spotlight offers more control over the angle and the beam than a flood light.
- These types of lights lenses vary in sizes ranging from 6", 10", 12" diameter of lenses.
- This type of light normally produces a soft kind of light. This is perfect for the front of the stage as it not a harsh light to look at and won't blind the audience members who are sat in the front row. This light beam doesn't stretch out very far its very short.

LIGHTING FIXTURES

Scoop

- A scoops lenses can range from 10", 14", 16", and 18".
- This type of light is a multi purpose reflector floodlight.
- Its used in all sorts of theatres as well as some TV shows as a flood light where space limitation is a crucial factor.
- These types of lights are ideal for sets hallways and different window backings where colour blending and smooth washes are light are needed.
- Another light that's similar to this is a **Par Can**. These types of lights are used as fillers to illuminate a small amount of pace that other lights cant fill. No direction is needed for this light.



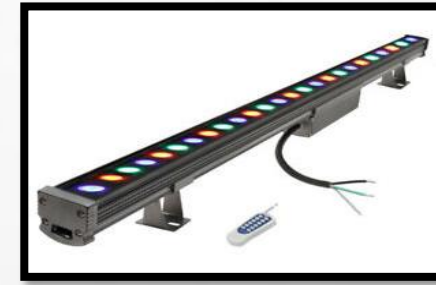
Intelligent Lighting

- These types of lights are fully automated. When using these lights in theatres the audience are very unaware about the fact that its an automated light. There movements are precise, quiet, and very subtle.
- These types of lights enable the designer to use one light for a variety of different jobs, the only thing it will need lime spent on is programming its movements and actions. Due to this it means that less time can be spent on lighting and more time can be spent on bigger and better sets. **Source -** <http://youtu.be/yCByNEigEJM>

LIGHTING FIXTURES

Strip Lighting

- There are a variety of different types of strip lights that can produce different colour lighting.
- Strip lights normally come in 3 or 5 circuit lights that can project solid colours of light or a variety of different colours. There are also LED strip lights that come with a bigger variety of colours.
- These lights can either be stationary or hug pieces of lighting which cover long throws of lights smoothly and evenly.



Follow Spot

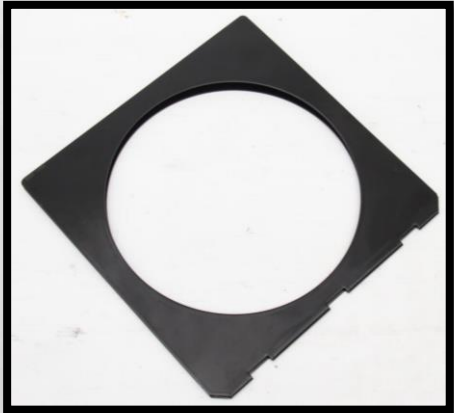
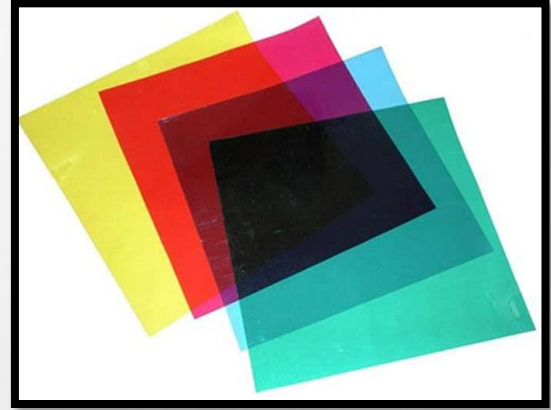
- These types of lights are used with manual control, meaning there would be a member of the lighting staff manually controlling the direction the light should be focused on. Normally the light would mainly be focused on the performer.
- The beam size, quality and colour are all factors that can be changed to match the LD's design ideas.
- These lights are used a lot in theatres and musicals especially when "following" the lead singer/actor.

LIGHTING ACCESSORIES

Accessories

- **GOBO** – this is a small stencilled circular disc, this accessories is used to create a projected image or pattern onto the stage. The GOBO covers the light, almost as a filter, and the light piercing through creates the chosen pattern. You can also get water style GOBO and Glass GOBOs which produced crystalised images due to the glass in the filter.
- **GOBO holder** – accessories basically holds the GOBO in place over the light, they can vary in size to fit the correct GOBO needed.
- **GOBO rotator** – a GOBO rotator is a carefully manufactured machine which rotates GOBOs to create two different types of images.
- **Colour Gel** – this is a colour filter that goes over the front of the light and change the colour of light being produced. Recently I had the opportunity to work with Colour gel and its really easy to install over the light. Essentially all you need to do is place the gel frame on top of the colour gel sheet and cut around it, this should then easily slot into the frame and the slot onto the light.
- **Gel Frame** – This basically hold the Colour gel in place over the front of the light.
- **Top Hat** – Top hats control the light spill and reduce the viewing angle of the lighting lenses. **Source -** <https://www.citytheatrical.com/Products/standard-top-hats>
- **Barn Doors** – These are light modifiers that can shape the direction of light to fit your lighting plan.
- **IRIS** – This lighting device can change the beam size being produced from the light.

LIGHTING ACCESSORIES



LIGHTING EQUIPMENT

15 AMP Plug

A 15AMP plug and plug socket are the standard connectors used for stage equipment. Its made from three metal contacts and doesn't include the use of a fuse, which clearly makes it stand out compared to an average connector.

16 AMP Plug

A 16 AMP connector is usually a blue plug. These types of plugs are normally used in newer installations. Its often used to power types of equipment that shouldn't be connected to a dimmer (because it contains no fuse)

5 AMP Plug

A 5 AMP connector are used prior to the 15A, they are now scaled down version and contain now fuse

Source -[visual-glossary.pdf](#)

Amplifier

This type of equipment boosts a low voltage signal from microphones, CD players, and mixing desks into a signal which is suitable for loud speakers. Normally each speaker will require its own amplifier channel so each amplifier unit will usually contain two channels.

Birdie

This type of equipment is a small lantern which is used to limit lighting spaces over short distances, for example, a theatre set. These types of lanterns create a bright, soft-edged light pool. The light actually gets its name from the golfing term for being 'one under par.

LIGHTING EQUIPMENT



LIGHTING EQUIPMENT

Coms

To Simplify comms its basically a network of headsets with microphones that stage managers and technical crew members where to communicate with one another during a performance.

Cue Lights

Cue lights are used to give technical staff and actors the cue to be quiet. There are many different types of devices like this across the world but in the UK the red light normally means 'stand-by' and green means 'go'. Either the actors or technicians will acknowledge the cue by pressing a button which will make the red light stay on constantly until turned off.

CYC

This is a type of flood light which has an asymmetrical reflector which will produce a type of soft, evenly distributed wash onto vertical surfaces. They can be positioned anywhere around the stage.

Cyclorama

Cyc is a type of cloth that is usually hung at the back of a stage. The cloth is normally white so that images and colours can be projected onto it and stand out.

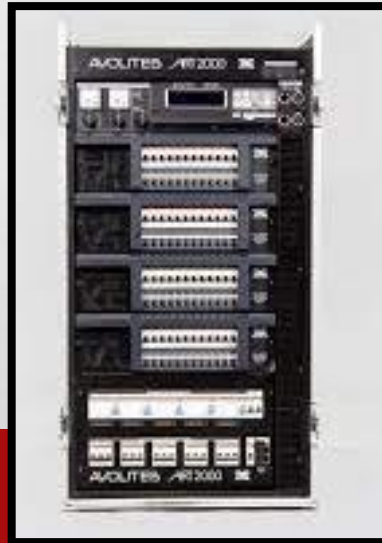
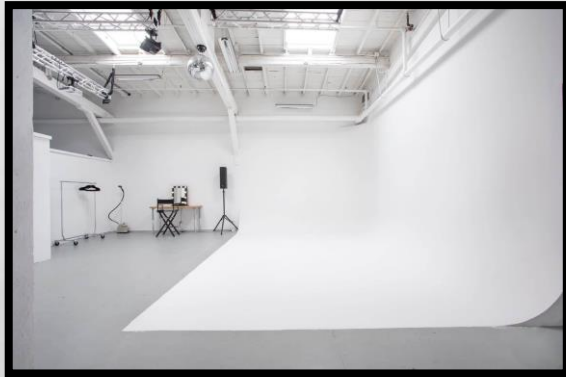
Dimmer

The dimmers role is the control the amount of electricity that's reaching the stage lights by changing and adjusting the power coming in and out. When the power arrives at the dimmer the wattage and the lights intensity will be reduced.

DMX

A DMX is a wire that sends signals of command binary controls that is sent to a variety of different stage equipment mainly associated with lighting equipment. Each piece of equipment carries a unique address and receives commands, such look down, turn on and much more.

LIGHTING EQUIPMENT



LIGHTING EQUIPMENT

Flood

This is a types of lantern with a fixed beam and no lens. There are two different types of flood lights, there's symmetrical reflector and asymmetrical reflectors. Symmetrical reflectors usually give off a soft edged wash of light which can be used for overhead washes. An Asymmetrical reflector gives off a soft wash of light normally on vertical surfaces.

Lighting Desk

This is the control centre of all lighting actions and cues that take place during the show. The lighting desk can be a very complex thing to use, however over time and with a little practice it gets a lot easier the more you use. The lighting desk has the ability to record and playback lighting scenes, control the level of light intensity and much more.

Lighting Stencil

Lighting stencils have symbols on them which lighting designers use these symbols to mark the positions of the lights in their designs.

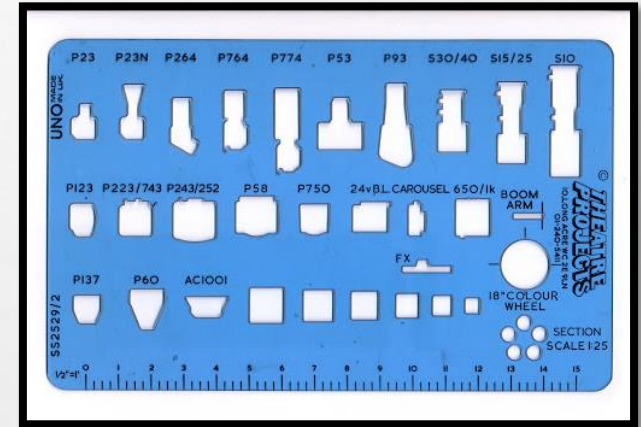
Microphone

This device is used to enhance the volume of the actors voices on stage. They send electrical signals, which are normally very low, through to the mixer where they are then amplified in the mixing desk and can then be amplified even further through the speakers during a performance.

Mixer

Also known as the sound desk, the mixer contains a number of input channels where all the sources can be controlled. Majority of mixers can change the sound by boosting frequencies.

LIGHTING EQUIPMENT



LIGHTING EQUIPMENT

Moving Light

A moving light is a remotely controlled lanterns which can programmed to move in any direction or tilt the angle of the light as well as change focus, zoom in and out, change colour and a lot more.

Patching

Patching is a method that allows the lighting crew to cross-connect light circuits to dimmers. Normally this would be done at the dimmer but because electrical circuits have been added in they were patched to the chosen dimmer.

Radio Microphone

This is a type of transportable radio that has a microphone attached too it. The receiver picks up a signal and is then sent to the mixing desk.

Smoke Machine

This machine creates smoke which add a special effect on stage. It can be used in many ways for example, in the phantom off the opera a smoke machine is used when the phantom is first seen in the mirror. It's a non toxic fog created by vaporising smoke fluid.

Stage Management Desk

This is the control centre back stage where the stage manager will co-ordinate with the performances. It contains the entire script with all the directions as well as a headset, a red and green que light and so much more. It also has a silent fire alarm indicator as well as controls for the safety curtain.

LIGHTING EQUIPMENT



LIGHTING EQUIPMENT

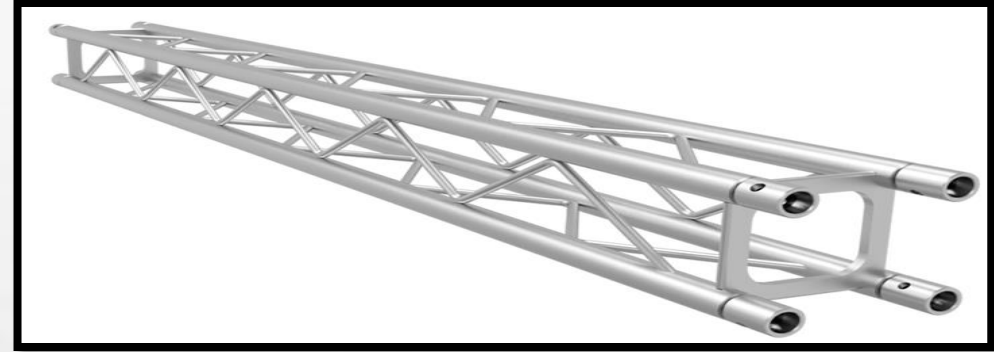
Stage Curtains

The stage curtains help keep the backstage areas hidden from the audience. The curtains are made of a very thick material which doesn't allow any sort of light to slip through. There are a variety of different types of curtains on a stage, for example, the backdrop, borders, and the grand drape.



Trussing

This piece of equipment is a welded frame made up of alloy bars designed to support lights with a strong and secure structure for hanging equipment.



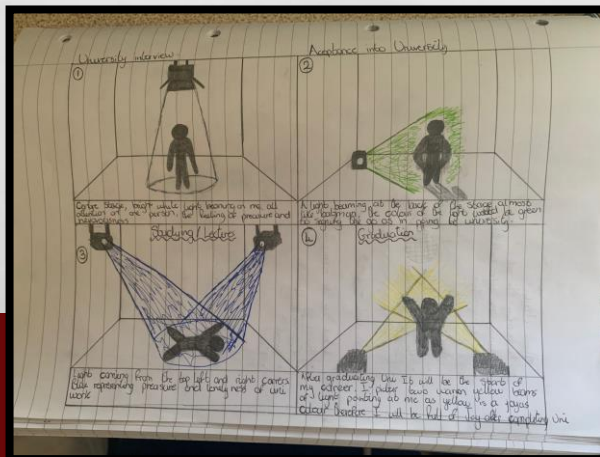
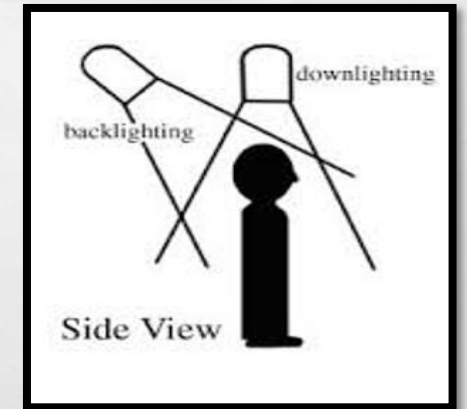
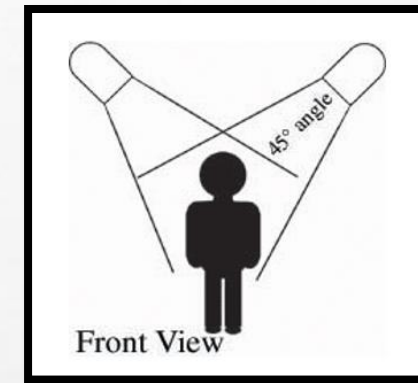
XLR

This is a specific type of connector which is used a lot with stage lighting and sound. Normally these types of cables have 3-7 pins. 3 pins is the most common out of the cables which is used a lot in sound for DMX

THE MCCANDLESS SYSTEM

Stanley McCandless was the father of modern stage lighting, he released a book called 'A Method of Lighting the Stage' back in 1958. he created his own system of lighting design. On stage each acting area would be lit by two lights both in a position of 45 degrees in the area where the front lights would be. This method would enhance the shadows of the actors on stages creating an affect which would draw the actor away from the background of the stage. The best type of light to create this effect is an Ellipsoidal. In order to separate the actor from the background down lighting and backlighting are crucial. If its successful it should hopefully create a 3D appearance. Its important that these lights aren't brighter than the front lights otherwise the effect wont work properly and it will look unrehearsed on stage. Fresnel's or PAR Cans are perfect for back lights. Source-

https://mo01931486.schoolwires.net/cms/lib/MO01931486/Centricity/Domain/1746/Light_Design_Theory_Notes.pdf



During our lecture we were given a task to create a story board on own journey to university. In this story board we had to chose the correct lighting positions and colours that represented how we felt at the time. I found this was a good exercise as it helped me understand what effect the position of the light and the colour can make an audience member feel.

HOW TO RIG A LIGHT

I have no experience whatsoever in the lighting industry but recently I was given the opportunity to help rig lights for the third year production. Due to this I was very nervous about rigging the lights but later discovered that it's a fairly easy job when done correctly. I am going to write a step by step plan that I was taught to help me rig almost any stage light which is normally used on stage. I will use these steps on every lighting gig I get as it will help me for future jobs.

Steps:

1. Lift the light up and hook it onto the rig, once its on tighten the twisty nob at the back to secure its place.
2. On nearly every stage light there will be a safety wire that will stop the light from falling should it fall so, your next step is to secure that on the rig.
3. Next plug the light into the plug socket closest too it.
4. Its important to always check if the lights shutters are open if they aren't open the shutters, you'd be surprised how often people forget this step and end up with the light producing no light.
5. For the final step adjust the lights angle to the correct positioning and lock it in place.
6. When it comes to packing up the lights at the end of the show period just complete these steps from bottom to top.



COLOUR THEORY

The Colour Wheel

There are many different definitions on colour theory. Colour theory creates a logical structure and understanding of colour. If there was a large variety of different fruits on a table you are able to organize them by matching the fruits with the same colour and it will show the correlation with each different colour. There are a variety of different colours used in the colour wheel for example, red, yellow, and blue are all traditional colours used a lot in art. The first colour wheel ever created was designed and put together by Sir Isaac Newton back in 1666. Scientists and artists study and designed numerous variations of the design wheel. Even I can make a colour wheel, however it's not as easy as that, any colour circle/wheel that has a valid and logically arranged can be classed as a colour wheel. **Source:** <https://www.colormatters.com/color-and-design/basic-color-theory>. Colour can also be used to represent emotion, there is no correct answer but it's based on opinion. For example the colour red to me represents danger and to stay away, or the colour blue represents sadness because it matches the colour of Water and water can lead back to tears. As a lighting designer it's up to you to represent the character's emotion through lighting, it would be embarrassing if there was a sad scene on stage and the lighting designer chose a warm happy colour to match the scene.



LIGHTING DESIGN PROCESSES

What are the goals of a lighting Designer?

- To be in charge of making sure the actors are seen on stage
- Direct the audiences attention.
- Setting – location, season/time of day, environment, and creating the correct mood and atmosphere.

Who and What is a Lighting Director?

- It is the LD's job to read the script and highlight and actions or changes in scenery or time of day and make note of them.
- An LD must always attend rehearsals
- An LD should co-ordinate and communicate with the directors and everyone in the production team.
- A good LD will conduct their own research.
- They will generate their own design ideas and communicate them correctly to the director and the design team.
- Creates various lighting plans.
- writes que sheets and lighting directions that match in time with the actions on stage.

What is a Light Source?

- A light source is something that can motivate and bring a scene to life.
- By using different types of light a LD can create different times of day, such as, Moonlight, daylight, dawn and dusk, as well as other lighting e.g. the headlights of a car or the reflection of water.
- Sometimes light doesn't have to be dependant on music, sometimes an instrument is all you need.

BASICS OF LIGHT

What are the basic tools of lighting design?

- **Focus** – what is actually getting the light? If it can't be seen then it's not on stage therefore everything on stage needs to be seen. A lighting designer must highlight the entire set as well as keeping the focus mainly on the actors. Using composition can help draw focus to stage.
- **Angle** – think about where the light is coming from, does the light suit the performance? Consider how the multiple lights and angles will interact with one another, what silhouettes will they create?
- **Intensity** – how bright must the light be, always think about which direction the focus and intensity the light is aiming at.
- **Quality** – the quality of light is very important, the quality of light can be varied from being hard/soft lighting or will the light be textured? Light can also be dependant on music, for example if there is a storm scene the lights will be flickering and the music will be loud.
- **Colour** – choosing the right colour of lighting is one of the hardest tools to master. When mixing lights it's important to use the correct colours, the colours most LDs use are the primary colours red, blue, and green. The correct colour choice can support emotional effect, can help to set the scene, can give good shape and form, and create perfect harmony and contrast colour with compositions.
- **Movement** - cues must be kept on strict orders and in time with music and the actions of the actors. Think about the actions the lights need to follow, such as, split fades, part cues, and more.

Typical lighting angles

- 45 degrees (the magic number)
- Front
- Top view
- Side view

4 FUNCTIONS OF STAGE LIGHTING

Visibility – Stage lighting should always provide the audience with visibility of the stage and the actors. The lighting should direct their attention.

Motivation – For the majority of events lighting designers want to make the lighting seem natural to the environment and setting.

Composition – For plays and musicals the lighting director will work closely to the scene designer to ensure that the background, props, and actors are visible on stage.

Mood – The lighting has the ability to set a mood by changing the colour or pace of the light

Controllable factors of lighting

- **Intensity** – this can vary the light from being completely dark to blindingly bright.
- **Distribution** – the pattern of light being projected onto a surface
- **Colour** – you can use nearly every colour you can think of and use it as a filter to change the colour of light being produced
- **Movement** - this refers to the change in direction of light and choosing a specific point to aim the light

Where to Start

- First define the area you want to illuminate
- Distribute all the lighting fixtures to help illustrate the actors from the scenery.
- Use different colours to support the shape and form of the acting area and the actors around it.
- There must be enough of the light to perceive the colours.
- Objects of importance must be highlighted.

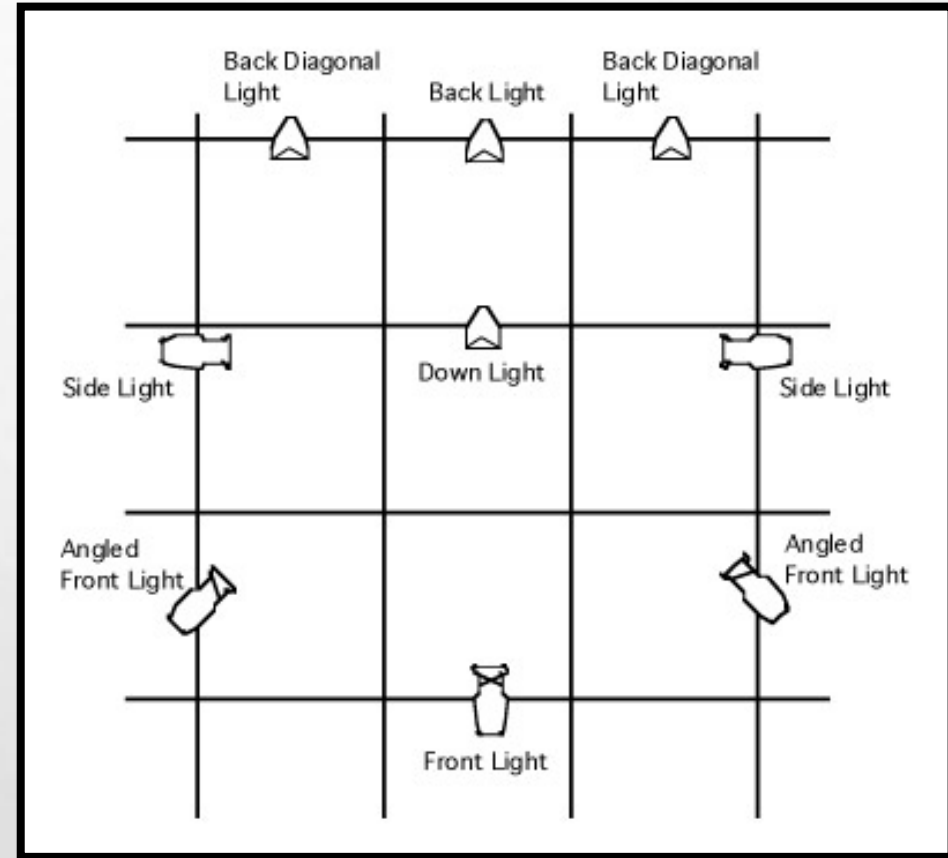
LIGHTING POSITIONS

Top Light – This lighting position is directly above the performer. This light is sometimes also known as the God Light

Side Light – This light is used to sculpt the actors body. This type of light positioning is normally used in dances or musicals.

Back Light – this light is either directly behind the performer or at an angle.

Silhouette – This type of lighting is either directly behind the performer or lighting up the surface behind.



AN LD'S EARLY DESIGN PROCESS

- The first thing a LD must do before designing is to read the script. The first time you read a script should be fun and enjoyable, the 2nd and 3rd time is when the real work has to kick in. by reading the script over and over again an LD should be able to pick out “clues”
- An LD should always stay in contact and communicate with the director at all times.
- If there is any extra reading material on the production you are working on or there any soundtracks to listen too, listen to them, this extra information can help a lot when the time comes to start the lighting design.
- Once again confirm your findings and all your research with the director and help him/her uncover as much detail as possible.
- Always repeat these steps

Analysing the Script

- Read the script once and take it all in.
- Read it more than one and pick out key information and clues such as stages directions, the time of day or what season it is, and different types of location references.
- Always think about each of the scenes in detail and think what direction the light is coming from. Timeline

How to communicate with the Director

- Majority of the time directors don't know what lighting can do to benefit the performance.
- Always offer your lighting ideas to the directors, there is nothing wrong with giving them your thoughts and opinions.
- Don't talk in specifics, talk in terms of a general idea.
- Go to the directors with different types of interpretation questions.

DESIGNING TOOLS

Lighting Concept

- There are a variety of different factors and contexts that will need to be taken into consideration when it comes to designing light, for example, what direction is the light facing, the colour of the light and what effects are needed on stage to complement the lighting.

Key Colours and Cue List

- Its useful to have gel pieces matching correct colours.
- Help convey with colour experts and talk about specific colour choices.
- Cues allow easy organisation and sets you up to an easy advancement in production.
- Always useful to mark cues, locations, descriptions and timings noted in your script.

Visual Research

- Its always good to keep your ideas noted down kept in one place, such as a not book, sketch pad or computer document.
- Sometimes pictures can be better than words, as a lighting director you have to take into consideration all sorts of factors such as colour, angle, mood, and quality.

Scene Analysis

- There should be a scenic analysis for every single scene.
- Take notes on the colour, direction, and description of all the sources in each scene.
- The analysis should consist of a brief description of the setting/time of day, the mood of the scene, and all other motivating factors.

WHAT HAPPENS DURING TECH WEEK?

Tech week is a crucial time for lighting designers as it's the week where all the equipment that's going to be used is tested and set up ready for the performance. This week's main purpose is to incorporate all of the technical elements that will be used through the show, for example, props, sets, costumes, lighting and sound, so that the actors can get used to using them before opening night. The reason why a whole week is dedicated to these elements so that if any changes need to be made it can be done so during this time. It would be the lighting director's job to look back at their cue sheets and lighting boards and perfect the timings and practice using the lights in different rehearsals. Everyone on the lighting and sound team should have their own script so that there's no confusion when cues are called. It's always good to note a cue with a certain line that the actor makes, making it easier so that when that line is said the LD knows that a lighting action is needed.

Source - <https://www.clevelandplayhouse.com/files/assets/ch12techweek.pdf>



PRODUCTION NOTES

The Production Notebook

- A Lighting designer should always keep a production notebook with them on hand at all times.
- These notebooks consist of any changes that have happened during tech week, various cues and signals that the director themselves have made, and any extra notes that they haven't been able to keep on their script.
- This notebook also keeps track of lighting plots and actions
- It contains all analysis' made in each scene and an exact colour list of all the lights and filters needed.
- All of the instrumental cues are also in this notebook to help with cues.

Lighting Plan

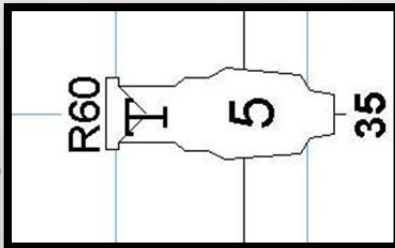
- A lighting plan conveys all sorts of information from the designers to the Chief electrician as well as the rest of the lighting team.
- The lighting plan contains the different details and information on all the instruments the lighting team are using such as the type, position, orientation, colour, any accessories, and circuiting.
- Each layout of the lighting plan should be personal to yourself.
- The lighting plan can either be drawn by hand or created using CAD.
- The lighting plan is normally drawn to scale as it helps the creation of the plot and is accurate.
- The lighting plan should contain enough information to rig all the lights without the need of the designer.

LIGHTING PLAN/SYMBOLS

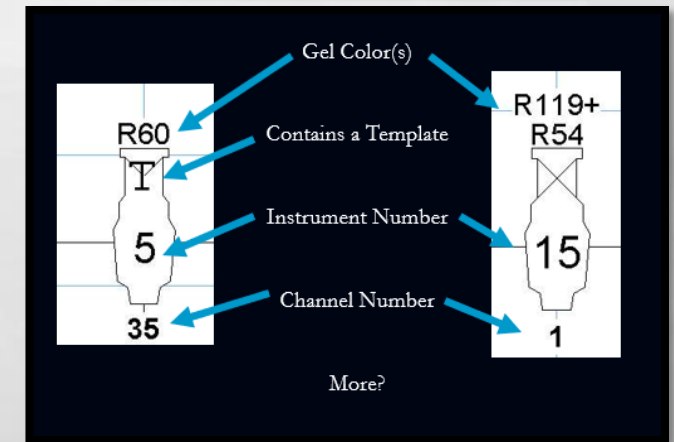
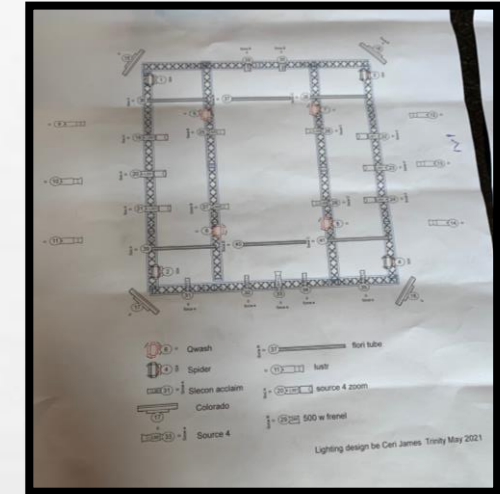
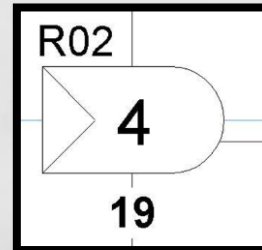
- To help simplify different rigs and equipment symbols are used.
- Symbols help convey all the applicable information for each individual given instrument.
- The symbols include keys to map the instrument types
- These symbols can be very useful when creating a lighting plan

Recently I got to help the third years set up the lighting rig for their production. I've haven't had any experience in rigging up the lights or even looking at a lighting plan. As it was my first time I was really nervous that I would get something wrong but funnily enough it was actually quite simple. The lighting plan was really easy to follow and at the bottom of it there was a source that had all the symbols labelled which made the lighting plan a lot easier to follow. I learnt it while working for the third years, and all the information I've taken in from this experience I will use for future jobs.

Ellipsoidal



PAR 64



SOUND DESIGN

What is sound design?

Sound design is what filmmakers use to enhance any films mood, tone, and atmosphere. Sound design is a huge department in a production. Sound designers use components such as special effects, mixing, foley sound design, music, and dialog. Sound is one of the most important parts of a film, the right music can change an entire film, for example, George Lucas said on an interview that the entire star wars franchise is built in the way of a silent movie, the music is what really tells the story and had a massive impact on the audience. Sound designers don't record audio on the actual set, the on set audio is left in the hands of the Production Mixer.

What does a Sound Designer do?

The sound designer is personally in charge of creating the film/productions sound. The sound designer might serve as the only person on the entire sound crew responsible for the productions audio. There are many different types of roles in the sound department, for example:

- Foley Artists
- Audio Engineers
- Re-recording Mixers
- Dialogue Editors
- Supervising Sound Editors
- ADR team
- And Much More!

Source - <https://www.studiobinder.com/blog/what-is-sound-design-for-film/>

BRIEF HISTORY OF SOUND EFFECTS

Many years ago, way before technology, the first piece of sound effects was a man in New York who was a musician for CBS radio. He was a drummer in a band and played a type of music called 'mood music' which actors would dance and act too. After a few years this type of entertainment began to get really popular and therefore a new entire department was created consisting of well staffed sound designers. Back then most shows would consist of two sound effect people, sometimes three. An example of a show that needed a team like this was 'Gangbusters', shows like this needed more than just your average physical sound so the sound they needed to make had to mean more than what it was emphasise to be. Factors they needed to consider were as simple as a knock at the door. Due to the show being on the radio there were no visual effects so they had no idea who it would be behind the knock, therefore they needed to create a distinct sound defining whether it was a man at the door or a woman. They also had to demonstrate the emotion that person was feeling, was it an angry knock? A sad knock? Or a happy knock? Such a small thing most people wouldn't even think about. As a result to this breakthrough in sound effects sound designers needed to begin to specialize in their jobs. This opened up the door to other types of genres such as comedy, drama, and much more. However for the sound designers that specialised in dramatic shows had a struggle with developing 'feel' of comic timing. **Source** - <https://vocal.media/futurism/history-of-sound-effects>

SOUND FX EQUIPMENT

Recording Studio

This is the headquarters where sound designers record sound for mixing purposes. Voice over artists use the recording studio amongst many others, such as vocalists or bands. These spaces are designed for the best possible sound, the put insulation on the walls to trap the sound in the room to create the clearest sound imaginable.

Signal Processors

These types of devices off the technician the chance to manipulate auditory sounds or signals. The signal processor is commonly placed in the audio broadcasting, which takes place just before the transmitter. The audio processor van has the ability to correct errors in the sound signals and adjust volume if needed.

Source - <https://stagestudioprojects.co.uk/theatre-stage-equipment-glossary/>

Sound Reinforcement Systems

These devices allow a much larger audience listen to sounds a lot louder and a lot clearer. With the assistance of microphones, signal processors, amplifiers and any other loud type of speaker can guarantee the best of sounds.

Theatre Sound Systems

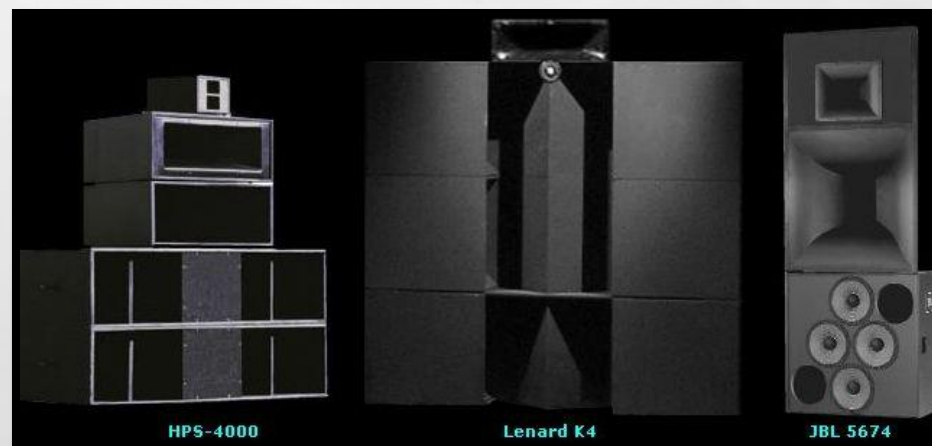
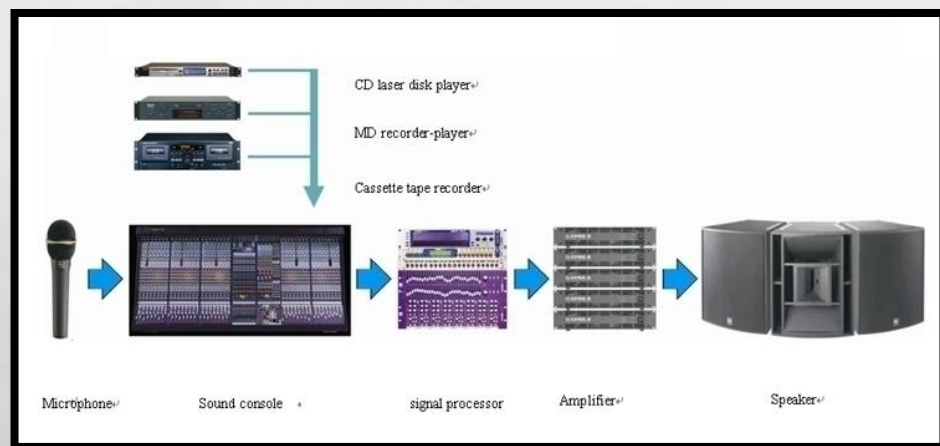
Majority of theatres have the luxury use of a PA system, amplifiers, microphones, and mixing desks. It's a sound engineer or technicians job to monitor all sound related to the performance and get the best sound possible and stick to a strict cue sheet.

Mixing desk/sound board

A mixing desk is a devise that can combine mixes, dynamics, and timbre levels of different pieces of audio signals. It can also bring together a variety of different instruments as well as parts of certain sounds together and play them at the same time.

Source - <https://www.prosystemservices.com/news/what-is-a-mixing-desk-and-why-does-my-event-need-one/>

SOUND FX EQUIPMENT



JOB ROLES ON THE SOUND DEPARTMENT

- **Sound Designer** – the sound designers job is to create all the sound concepts for the production. They also identify any other kinds of sounds that will be needed in the production.
- **Production Sound Mixer** – this persons job is to remain closely to the director, they must fulfil exactly what the director wants and what he in visions in each shot, they must also offer up their own ideas. They oversee the movements of the cameras and all camera maintenance.
- **Boom Operator** – this persons role is to work closely with the production sound mixer by operating the boom microphone. The boom op positions microphones around correctly whenever sound is needed in a certain location. The microphones must be positioned correctly to ensure that the sound is the best it can be and all dialog and sound effects can be heard.
- **Composer** – it's the composers job to write all the music for a production, its important that the mood for each scene fits correctly with what the director wants.
- **Music Supervisor** – this person will work with the composer, mixers, and sound editors to create and combine all the productions music together. Their main responsibility is negotiate the use rights for all sources of music being used in the production.
- **Foley Artists** – this person will create post-sync sound effects for the production. They will record and create sounds which will be synced with pictures in very creative ways.
- **The 2nd AS** – AKA the cable wrangler, this persons role is to assist the boom operator. The will prepare all the equipment and remove any obstacles in the way

Source - <https://liftoff.network/roles-sound-department/>

WHAT IS THE FUTURE OF SOUND?

Sound design heavily relies on good soft wares and having the best and reliable equipment on the market. As technology advances more and more products are being manufactured with the intentions of creating the best sound possible and making it easier to design sound sequences. Earlier in 2019 a brand new software was released called Sound Particles 2.1. this software is basically the CGI of all audio software's. This software allows the sound designer to create an entire landscape full of audio files. When creating a sound file there are a variety of different templates that you can choose from which will help create the perfect sound or action required, for example, the sound of flying out of a cave or just casually flying by. This software has access to a massive range of track pre-sets, it also gives you the option to save these pre-sets and create your own, then use them later for different jobs. This software is very easy to use and will have a massive impact on improving the sound industry. **Source** -

<https://www.youtube.com/watch?v=lQtslOqhBY4>, **Source** - <https://www.pro-tools-expert.com/production-expert-1/2020/1/3/sound-particles-release-v21-of-their-cgi-for-audio-sound-design-software>



FINDING SOUND EFFECTS

As I have no experience in the sound industry I would have no clue where to look for decent sound effects which are easily sourced. My friends suggested I do research on a website called **Epidemic Sound**. My friend creates music videos and small clips for YouTube and in his lectures. He pays the monthly subscription of £15 and he really enjoys using it. After doing a bit of my own research I found that this website has over 32,000 tracks as well as 64,000+ sound effects. This is a huge variety of different sound effects and tracks sound designers can use in a production. They also state that they post new tracks on their website every week! So the website is very up to date and seems really reliable. The website give you the option to separate a sound or track and re create song to suit your needs. There is no need to worry about using this website and not having to deal with any pop up add or viruses that could occur on other dodgy websites. **Source** -

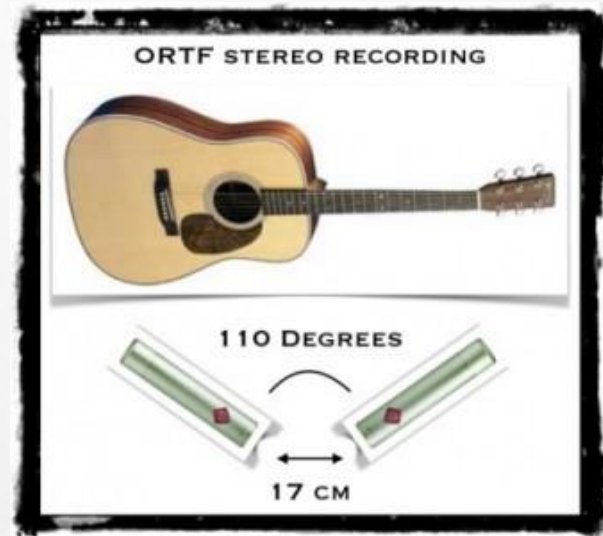
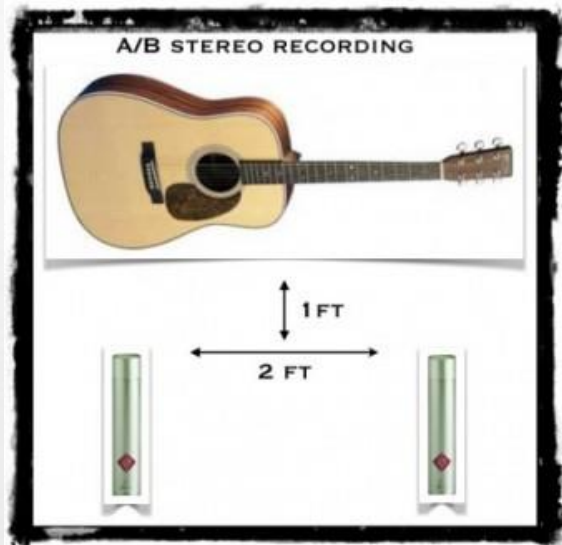
<https://www.youtube.com/watch?v=KNjGkiLpTLc>



RECORDING TECHNIQUES

Upon my research I found that there are 5 useful recording techniques, each of these recording techniques are different in their own way and all have different ways of recording the right sound.

- 1. A/B Stereo Recording** – This type of recording normally uses two omnidirectional microphones, both positioned towards the instrument at least a foot distance away with two feet between each microphone. By using this method the sound should sound staggered as the time the sound waves arrive at the mics the sound will be slightly staggered. However due to the fact that the sound is staggered it could create a lot of issues when combining the stereo signal to mono.
- 2. X/Y Stereo Recording** – This types of recording method uses two directional microphone, normally with a small diaphragm condensers. The microphone are positioned normally with an angle between 90-135 degrees. This allows their capsules to coincide at a single point. Depending on how wide the angle is will make the stereo image wider. This method should have less of a stereo effect than an A/B and will have no differences between the timing.
- 3. ORTF Stereo Recording** – This method uses two directional microphones with a small diaphragm condensers. The microphones should be positioned outward of an angle of 110 degrees with the capsules spread 170mm apart. This method should combine the previous methods together. Because of the spacing of the mics the recording should pick up less of an ambient room sound.
- 4. Blumlein Pair** – this method typically uses two figure 8 mics which are positioned in he same way as the X/Y method. This method captures a greater portion of the rooms sound and add more ambiance to the stereo image.
- 5. Mid/Side Stereo Recording** – this method uses one small directional condenser mic with one large diaphragm condenser mic (must be figure8). The figure 8 mic is at a 90 degrees angle facing sideways from the instrument. The other mic can be placed either at the top or bottom of the instrument. It should create an added stereo width of the A/B technique and a mono capability due to the X/Y technique with an increased room ambience.



Source for
previous slide and
images -

<https://ehomerecordingstudio.com/stereo-microphone-techniques/>

BASIC EDITING TECHNIQUES

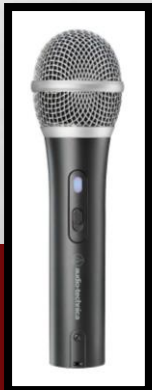
<https://blog.storyblocks.com/audio-tutorials/7-essential-audio-editing-tips/> - Source

1. **Editing's begin with a good recording** – always make sure that whatever recording device or editing software you are using is one that you are familiar with. Its always a good idea to ad at least a second of silence both before and after a recording. By doing this it will make mixing the recordings a lot easier. To achieve the best result possible make sure that the source the sound is coming from is close to the microphone.
2. **Use a trusted software** – there are a variety of different software's out their that are free and easy to use, however just because its free doesn't mean that its reliable, normally with free website you tend to get a lot of pop up adds and viruses so always make sure to check the reviews. Computers like the mac book come with their own software. Apples own software is called 'GarageBand' and is fairly easy to use.
3. **Set Volume levels correctly-** when importing sounds or videos to your software make sure that their sound is zero level (baseline). Always listen to your creation though your computer volume which should be set to medium level. If something sounds too loud or too quite it ca be easily adjusted.
4. **Always dissolve or fade new tracks** – its very unwise to start playing a piece of music out of no where and could possibly startle the audience. It wont sound natural at all so by dissolving or fading pieces of music or sounds together it will be more of a professional thing to do.
5. **Don't forget room tone or background noise** – its your choice to chose when background noise is needed and when silence is all you need, by having this skill you will become a very successful sound engineer. It can completely set the scene
6. **Apply filters/effects** – this should only be done if you need it, if not done properly it can come across as sloppy and unprofessional.
7. **Use sound database for royalty free clips** – online resources like story block can be very useful for sound that you aren't able to record.

THE SOUND SYSTEM

A sound system is a combination of input, routers, amplifiers, and outputs. At first glance a sound system seems very complicated and hard to understand, but when breaking it down it actually makes a lot of sense. There are a variety of different pieces of equipment that make up a sound system, For example :

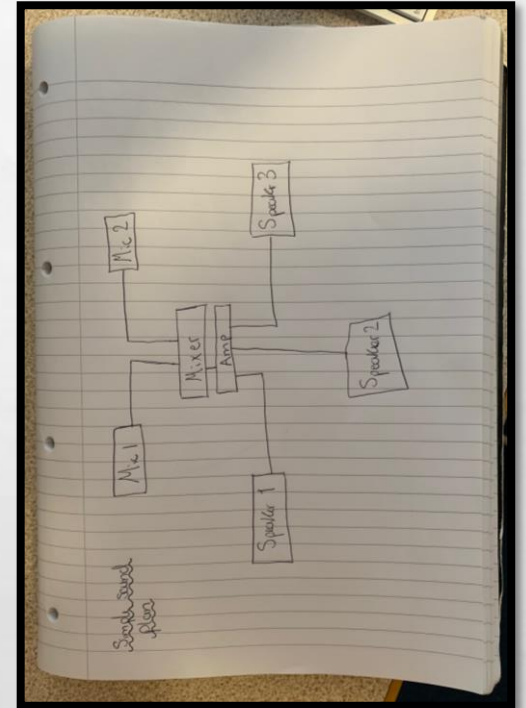
- **Sound Sources** – It all starts off with the source of the sound. Microphones are used to pick up the sound and bring it back to the mixer. Sources of sound can range from Singers, actors, acoustics, or music from your laptop.
- **Mixing Board** – mixing board or Sound desk is basically the control centre for the source. It can control the volume, and which amplifiers the sound will be travelling too.
- **Amplifiers** – the amplifier is connected to the mixing board. It's the amplifier's job to raise the power level of the sound signal so that it's able to travel to the speakers through large amounts of wires. The more power being put into the cables the better the sound quality will be coming through the speakers.
- **Speakers** – the speaker takes in the signal coming from the sound board and converts that energy into sound. This device helps the audience hear the actors' voices on stage or the music being played.



PLANNING A SOUND SYSTEM

Planning a sound system can be a very difficult task. It requires a group of people to work together and communicate with one another as well as other departments. Its important as a sound designer to think of every possible thing that will be creating sound in a production. Over time experience will help out a lot when it comes to making a sound design plan, but if you make a mistake there's no need to worry just tell a member of your team and try and fix the problem. As a sound designer you need to the of the area that you are trying to fill up will sound, for example, you need to consider people at the back of the room just as much as the people at the front as they could hear a lot more of the performance than the people at the back. Keep a note of how many speaker there are in your work space and the position of where they are. Its crucial that the equipment that you use is reliable and the best the production can afford as it will make the sound designers life a whole lot easier. Keep a note of what equipment you have and how much of each equipment you were given, for example, 40 Microphones. By doing this you will be able to keep track of how many there are and how many you need to give back after the performance has ended. All equipment must be looked after and taken with care as they might be rented and you don't want to break anything as it could interrupt the performance. When laying out the sound always refer back to the plan, if you finish laying out the microphones and speakers and there's no sound coming from any of them then the sound designer must have done something wrong when setting up, therefore always refer back to the sound plan. **Source** -

https://web.wpi.edu/Pubs/E-project/Available/E-project-031509-211712/unrestricted/atmt_FINAL.pdf



QLAB

What is Qlab?

Qlab is an editing software that sound and lighting designers use when production a show. There are a variety of different things that you as a designer can create on Qlab, for example, if you wanted to play a piece of music throughout the show you are able to do so. Qlab allows you to edit pieces of sound of videos off the internet and create your own cues and sequences for the production. On average about 500 or more cues can be used during a production so a lot of time and effort is needed when working on a software like Qlab. There are a variety of different function you can use on Qlab, for example, there's a feature on the software that allows you to fade pieces of music in and out of one another. Fades are normally used to loop pieces of music before the show so that the audience has something to listen too. I found Qlab difficult to use at first but I decided to persevere and look up online how to use it. Upon my research I came across a YouTube channel which was really helpful. This channel had a variety of different videos that helped me complete my final project and I was able to create a video with a variety of different sound effects to go with it. If I was given a sound job after my graduation I would take up the offer as I have a basic understanding of Qlab, however I am going to need a lot of practice if I am to become a professional at using the software.

Source - <https://www.youtube.com/watch?v=a9t91hAXs0o&t=2s>

PROJECTION

What is Video Design?

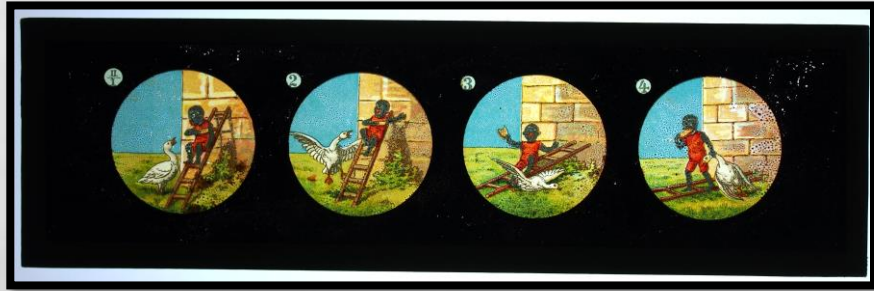
- Video design (also known as projection design) is a different creative field that is concerned with the integration and creation of film that uses motion graphics. It also concentrates on how camera feeds work in theatre, opera, dance fashion shows, concerts and any other type of events.
- Only recently has video design started getting recognition and has now been created to be its own separate field.
- The responsibilities video design would normally be dealt with by either a scenic designer or a lighting designer.
- Due to Video design becoming its own field a new job role has been created to over see everything that happens in this department. This person role is called the Video Designer. However the job titles name varies across the world for example, another name its known as is “Media Designer”.
- Video content and production has been used in performances plenty of times and has been doing well for many years.



PROJECTORS THROUGHOUT TIME

The Magic Lantern

The Magic lantern was first invented back in the 1600's by a Dutch scientist. Its one of the earliest forms of slide projection. The first source of illumination used in the projector was a simple candle. Pictures would be placed in front of the projector and displayed on the wall. The audience used to thought that they were being visited by devils and angles and therefore that's how it got the name 'the magic lantern'. During the 1880's it became very popular and used a completely new source of light, oil lamps. **Source** - <https://www.magiclanternsociety.org/about-magic-lanterns/>



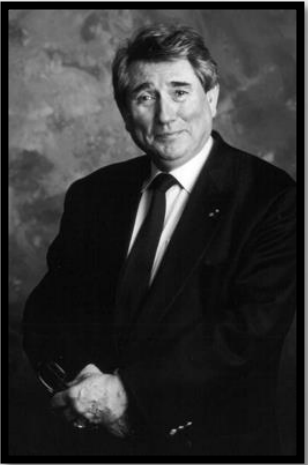
The Slides

These were hand painted picture which were invented in 1848 by Ernst Wihlem and Fredrich langenheim. These slides are transparent pieces of glass that are painted with black backgrounds and pictures that would tell short story's. Majority of slides would have wooden frames around them to protect them if they fall on the ground.

PROJECTORS THROUGHOUT TIME

Large Format Projector

this type of projector was one of the largest slide projectors ever invented. It was initially designed for theatres and opera houses. The first large types of slide projectors were developed with a bigger light source so that more light can be produced and with a bigger light source the projector will be more efficient as well as flexible. This projector enables bigger images to be projected on bigger surfaces to fill an entire stage.



Gunther Schneider – Siemssen

Gunther Schneider was a German born Austrian scenic designer. He worked as the chief designer for nearly all Austrian state theatres. He has created 28 productions for Herbert Van Karajan and 60 productions for Otto Schenk. He used lighting and projection on nearly all of his performances but he mostly designed for opera houses. He worked on productions like Der Ring des Nibelungen which gave him the nickname 'The Lord of The Ring'. Source - https://www.operanews.com/Opera_News_Magazine/2015/6/News/Gunther_Schneider-Siemssen.html



PROJECTORS THROUGHOUT TIME

Slide Projector

slide projector was massive leap from the large format projector. These types of projectors were used to display transparent photos onto a flat surface or screen. The light source that is used are light bulbs or a lime light. The slides that were used are 35mm transparent slides that were placed Infront of the lens and as the image was displayed it would enlarge. These projectors became very popular in schools and education.



Carousel Projectors

These projectors made a huge advancement in projecting colour. Not only could they project in black and white but also other colours like red, blue, and green. The trays would hold around 80 – 140 slides per rotation. The slides would be placed upside down and backwards so when the images are projected they're projected in the right way. This projector contains a motor that would automatically to rotate the tray and changing the image. It can be automatic or use a button.

PROJECTORS THROUGHOUT TIME

Overhead Projector

An overhead projector is another variant type of slide projector. It has a high powered bulb underneath a lens which condenses the light and transports the image placed on top of the lens on any surface. The image reflects off of a mirror which can be adjusted where the image is being projected. The images being projected are transparencies instead of slides. The transparencies must be faced up on the projector. This projector is used in the military and in fact my primary school used to have one, they're



Light Projector

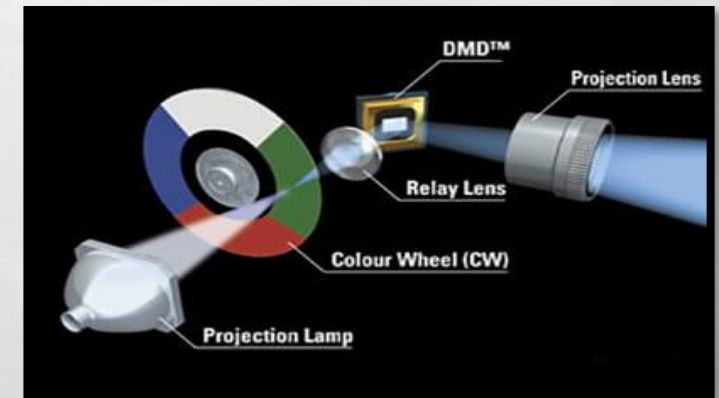
Early versions of tv and projections employed CTR technology which are easy to think of as small tv picture tubes. There are three different coloured tubes that supplied the overall image with incredible coloured detail. The coloured tubes are Red, Blue, and Green. Each of the tubes project onto the screen individually, however these tubes must be converged in order to get the correct image. If one of these tubes fail then the entire image will look off and unprofessional. These types of projectors use a lot of power which can be a really bad thing now-a-days.



PROJECTORS THROUGHOUT TIME

Digital Light Processing (DLP)

The use of DLP was a massive leap in the production of projectors and overall technology. Before this type of projector the only thing that was able to be projected was images, still pictures, but now with the use of DLP videos can now be played on a large scale with ease. The inventor of this advancement was Dr. Larry Hornbeck, he invented the very first DLP chip called the DMD back in 1987. the projector consisted of many small mirrors which were responsible for projecting a single pixel onto a screen. The mirrors reflected the light from a Xenon lamp which would project the images onto and surface. These projectors first became available to people back in 1996 and because technology gets better through time these newer edition was a higher accuracy and a lot faster. The way this projector would work is a very powerful laser would pass through a rotating colour wheel and would then create a flickering Red, Blue, and Green beam of light. This light would then the diagonal DMD which would bounce off and be projected in the right direction. The reason why a colour wheel is used is because the images would need to be coloured and because Red, Blue, and Green are the primary colours majority of colours could be made. This is due to the colour wheel rotating extremely fast. This is known as the Flicker Fusions Threshold.

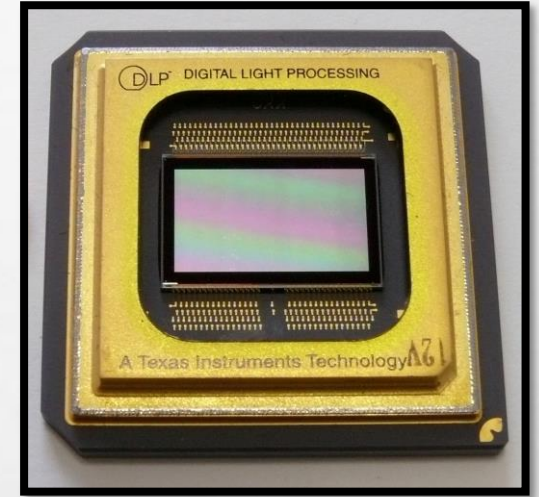


Source for bottom image - <https://www.viewsonic.com/library/entertainment/what-look-for-dlp-projector/>

PROJECTORS THROUGH TIME

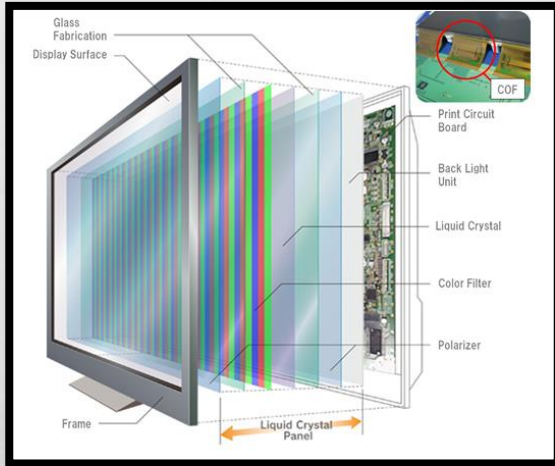
DMD

DMD stands for Digital Mirror Device. One DLP chip contains thousands of mirrors which are arranged horizontally in vertical rows. Every one of these mirrors have the ability to swivel in the direction the need to adjust too. It is able to move due to the Digital light Processing chip (DLP). There are very small controllers underneath each chip which enables a quick movement or change in direction. It's a fairly new technology which was invented by Larry Hornbeck, a worker of Texas Instruments.



LCD

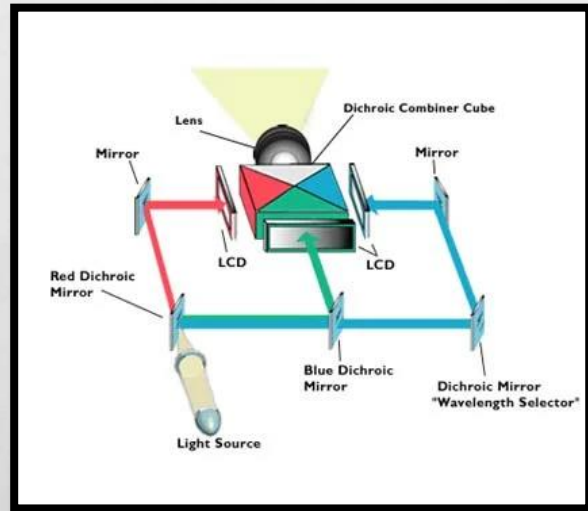
An LCD is a Liquid Crystal Display. This projector works by shining an extremely bright light onto an LCD panel. The LCD itself is a translucent screen which will create an image with the assistance of thousands of tiny pixels. The image gets displayed when the pixels are turned on or off thanks to the help of Liquid Crystals. These crystals have a very important property, they can be aligned with the assistance of an electric charge which can change the polarity of the light. . The Majority of LCD projector use only one LCD to create images, but the more expensive models use 3 panels which allows a more clear image on screen. That's where the name comes from, a 3LCD projector. Each of the panels display a separate colour which are then combined to make a full image.



Source for Top image - <https://www.projectorjunkies.com/new-dmd-chip-from-texas-instruments/>

3LCD TECHNOLOGY

Due to the Advancement of LDC technology the idea and creation of the LDC Projector was born. The creation of these crystals were discovered quite a while ago, however they only became available back in the 60's and 70's. it was first unveiled in the 1972 SID conference, the earliest prototype was a stepping stone in this technology but later got modified from a slide project with a matrix-addressed LCD which was invented by Peter J. Wild.



The inside of a 3LCD

The way this type of projector works is a very strong lamp shines a high focused beam of light at a Dichroic Mirror. This mirror is a special type of mirror that it can only reflect a certain type of wavelength which won't allow any other type of wavelength to pass through. Thanks to these mirrors the three beams of light can be separated and channelled towards a LCD panel. There are major advantages of using this technology is that the projectors can create amazing pictures on screens. The majority of high class projectors use this type of technology.

LAMP VS LASER

Lamp

- Lamp projectors are fairly cheap to purchase.
- Due to the projectors containing bulbs they are very easy to repair as you would only need to replace the bulb.
- Lamps are very cost effective, on the package of bulbs it normally comes with an estimate life expectancy of how many hours it will run for, for example 4000 hours. But its nit always true, remember its an estimate.
- Which each projector the have specific bulbs so s struggle when trying to replace the bulb. Shops wont always have the correct bulb in stock so to over come this struggle you can always look online or befriend a local AV supplier.

Laser

- Laser projectors are normally used for larger venues like museums or theatres.
- Laser projectors are a lot harder to repair because if the break you will need a qualified electrician to figure out and fix the problems.
- However laser projectors last a lot longer than lamp projectors especially if they're taken care of.
- Laser projectors are a lot more efficient and better quality than lamp projectors. The technology inside them are very advanced and can mirror anything you want it to display.
- The overall price you pay for a projector is worth it at the end of the day and in my opinion I think that its better in some areas than a lamp projector.

Source - <https://www.projectorreviews.com/articles-guides/affordable-laser-projectors-target-business-education-applications/advantages-laser-projectors-vs-lamp-projectors/>

PROJECTION EQUIPMENT

VGA Cable

This type of cable is a standard analogue display output which was a very standard on a lot of laptops and computers at the start of 1987, however has only just died out back in 2015. You can get a variety of cable like this that come in all sorts of sizes. The maximum size for this type of cable is 30 meters long. These cables send a simple signal too from the projector. These cable are fairly reliable and hardly ever break. However its best not to purchase a long versions of these cables as they become less efficient over a longer distance. VGA cables have 15 pins inside them which have to line up when plugging them in, and a common problem the occurs with these types of cables is that if one of these pins are bent then the display can appear damaged or discoloured. There is an adapter cable available for purchase to help connect VGA to HDMI.

HDMI

HDMI stands for 'High Definition Multimedia Interface'. These cables have become a lot more popular in the 21st century. The maximum length for this cable is 10 meters, so the VGA cable is a lot longer. However, due to the fact HDMI is a lot shorter it will be a lot more efficient and create a better image than VGA. There are a few down fall when using HDMI, for example, the better image you're trying to project the better HDMI cable you are going to need. Having higher resolution can really struggle over long distances of cable. To stop the resolution from suffering there is a device built especially to help boot the HDMI cable. This product is called A HDMI extender. A balun box is required at each end of the HDMI cable to convert the connection. This device also require the use of being connected to a plug socket and an internet/network connection. This device boosts the connection strength making the resolution a lot better.

VGA Cable



HDMI to VGA



HDMI Cable



HDMI Booster



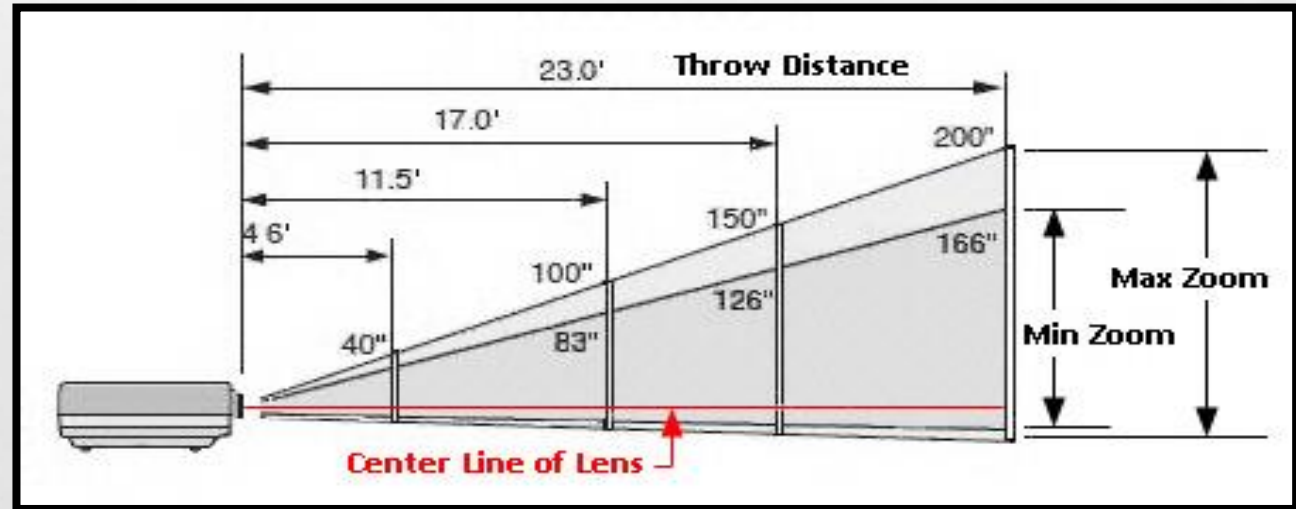
CHOOSING THE RIGHT PROJECTOR

Throw Distance

When it comes to choosing the right projector there are a lot of important factors a designer will need to think about. A crucial factor that you must think of is the Throw Distance. The Throw distance is the distance that's in between the projector and the surface of the projection. The closer the projection is to the screen the brighter the projection will be. An example to explain the throw distance can sometimes be expressed as a Throw ratio, e.g. a throw ratio of 2.5 means that if you want the image to be 2 meters wide then the projector must be 5 meters away from the screen. ($2 \times 2.5 = 5$).

Required Image Size

A larger image when projecting will need a short throw projector which has a wide-angle lens. These types of projectors are designed specifically for whiteboards especially interactive ones used in classrooms. The projectors would be mounted somewhere in the room not very far from the screen as they have a very large number of uses perfect for a classroom.



Source - https://www.projectorcentral.com/classroom_projector_buyers_guide_throw_distance_zoom.htm

CHOOSING THE RIGHT PROJECTOR

Projector Brightness

A projectors brightness is measured in Lumens. An average office projector can be capable of producing about 2000 lumens, which isn't that bad. However, more expensive and quality assured projectors used in theatres produce around 4000 lumens. The professional projectors which have to fight with extremely bright stage lighting produce around 10,000 lumens and possibly more! there is another version of lumens that can provide a more accurate measurement and that is ANSI Lumens (American National Standards Institutes)

Projector Orientation

Every projector shouldn't be tilted more than 30 degrees. A lot of designers use mirrors to reflect the image onto the surface area the intend to project onto. You must ensure that the mirror that's purchased is safely mounted onto the projector. Projectors come with a setting that enables them to stretch horizontally so that the image can appear rectangular when the projector is at an angle. This is known as Keystone Correction.

Projection sizes

Looking back at the DLP chip, each of the little mirrors create one pixel and the total of mirrors corresponds to the resolution:

SVGA - 800 x 600 pixels.

XGA - 1024 x 768 pixels.

HD 720p - 1280 x 720 pixels.

WXGA - 1280 x 800 pixels.

SXGA - 1280 x 1024 pixels.

HD 1080p - 1920 x 1080 pixels.

WUXGA - 1980 x 1200 pixels.

4K - 4096 x 2160 pixels.

8K - 7680 × 4320 pixels.

OVERALL COURSE SUMMARY

Throughout this module I have learnt a variety of different new skills. I've never really had any experience in lighting, sound, and Av so I'm really grateful to have had this opportunity and all the skills I have learnt I will remember and use them throughout my career. One skill I am definitely never going to forget in this module is how to rig a light. This skill will help more during any point of my career, if there are no jobs available for a set designer then I will be able to put my name forward and help with the rigging of the lights. I also really enjoyed reading a lighting diagram, this is basically a sheet that shows you the layout of each light and where they should belong on the rig. Another area which I enjoyed was the projection task. I had never really done projection before so once again I was learning something new. Qlab is really easy to understand and run once you get the hang of it, I was able to overlap videos and fade music in and out of cues on time and I really enjoyed using the software, this is something I am going to use all the time.

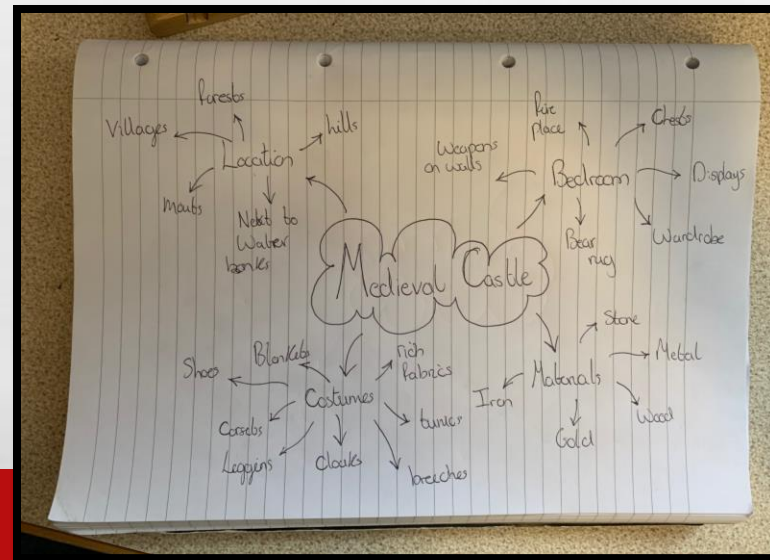
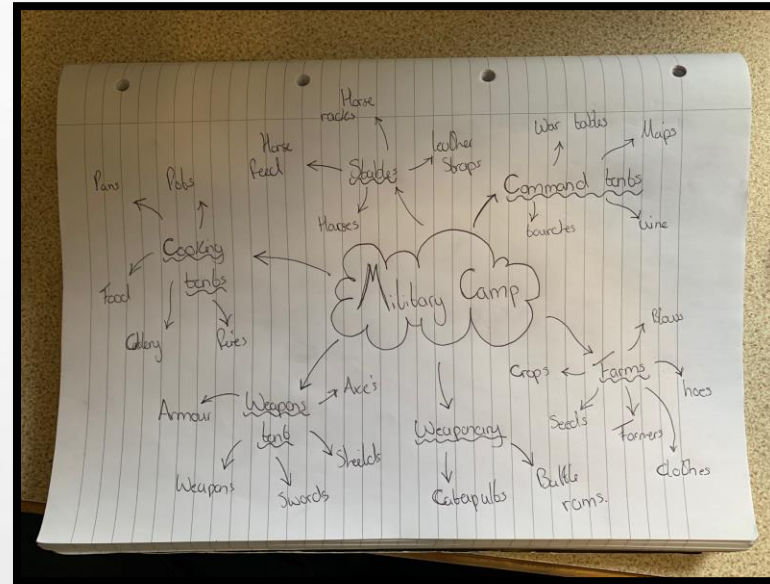
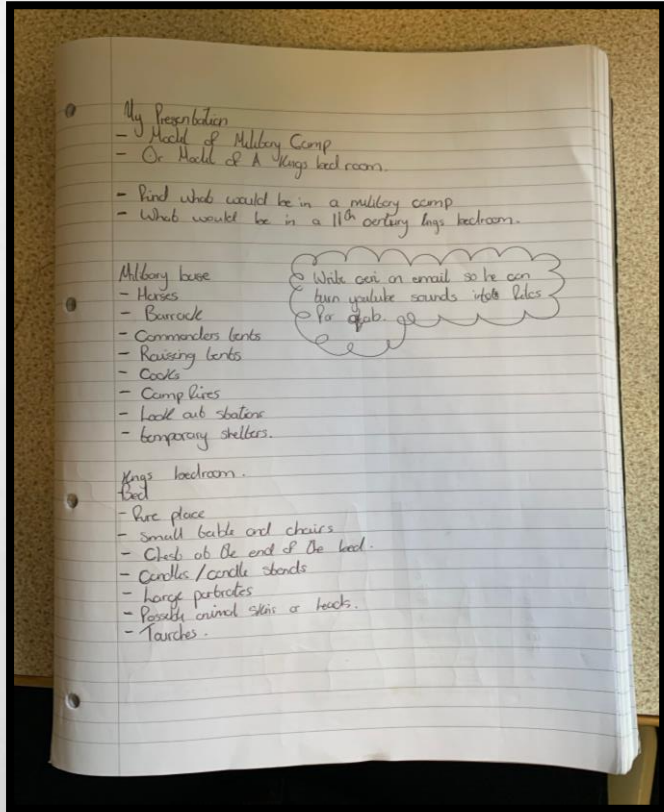
The subject I struggled to understand the most was sound. There's so much equipment needed for a sound and the sound desk to me just seemed really confusing, but I'm sure if we were able to physically work on a sound board I'd try my best to understand and have a go at it. I will try my best to find so experience in this area so that I can develop my knowledge and understanding.

MY MACBETH PRESENTATION

GEORGE WHITE – STUDENT NO.2004234



INITIAL IDEAS



At the start of this project I was very confused and unsure about what I wanted to create, so I just started brainstorming ideas and started jotting down all the different aspects, buildings, and other items that were around the time Macbeth is based upon. As I hadn't seen Macbeth before I had no idea the type of emotion and feeling this play was portraying so after reading a brief summary I chose a scene and watched clips of the scenes on YouTube. The scene I ended up choosing was the king's death scene, this scene is a very important part of the play as it's where Macbeth started setting the witches' prophecy.

MACBETH PRESENTATION

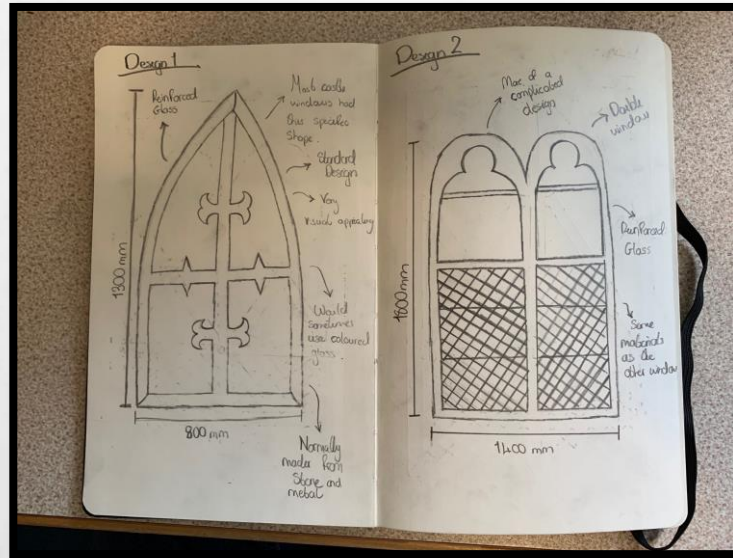
Overall Notes and Summary of Play

- Brief appearance of a trio of witches
- Military camp
- Macbeth and Banquo defeat an invading army led by a rebel known as MacDonwald.
- Macbeth and Banquo encounter the witches as they cross a moor (Moor – a habitat found in upland areas in temperate grasslands)
- The witches prophesise that that Macbeth will become a thane (a rank of Scottish nobility). A thane is kind of like a king but isn't as powerful, they own their own plot of land and a castle.
- Macbeth will soon become king of Scotland prophesised by the witches.
- Banquo will beget a line of Scottish kings (start a line of kings through his decent) but he himself will never be king.
- Both soldiers don't believe the witches at first until some of the king men congratulate Macbeth and tell him that he is now the thane of Cawdor.
- The previous thane had betrayed Scotland by fighting for the opposite side.
- Macbeth is now intrigued by the witches prophesy.
- Macbeth visits the king and plans a dinner with him at Macbeths castle, but before Macbeth wites to his wife telling her what's happened.
- His wife wants Macbeth to murder the king and take his place, she manages to persuade him to do it.
- Their pan is to frame the maids and to get them and the king drunk so they cant remember the next morning.
- While the king slept Macbeth stabs him.
- When the body is discovered Macbeth kills both maids purely out of range for their crime.
- The kings sons get scared and flee to England and Ireland.
- Macbeth became fearful of the witches prophesy and hires some people to kill his best friend Banquo and his son Fleance.
- Fleance manages to escape but Macbeth gets visited by Banquo's ghost at a meal and get paranoid.
- Macbeth causes a stir between his guests and his wife try's to calm things down but people start turning and judging his leadership.
- Macbeth visits the witches and they show him another prophesy he ends up getting killed by a man called Macduff.



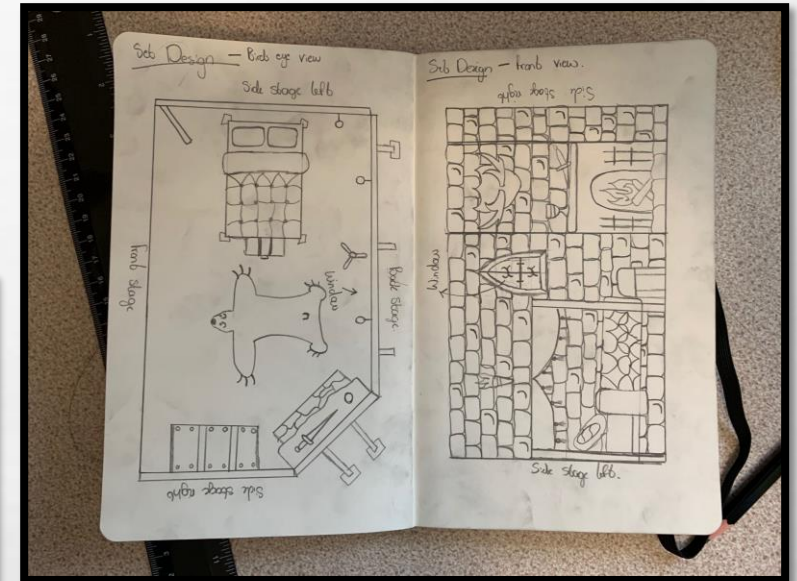
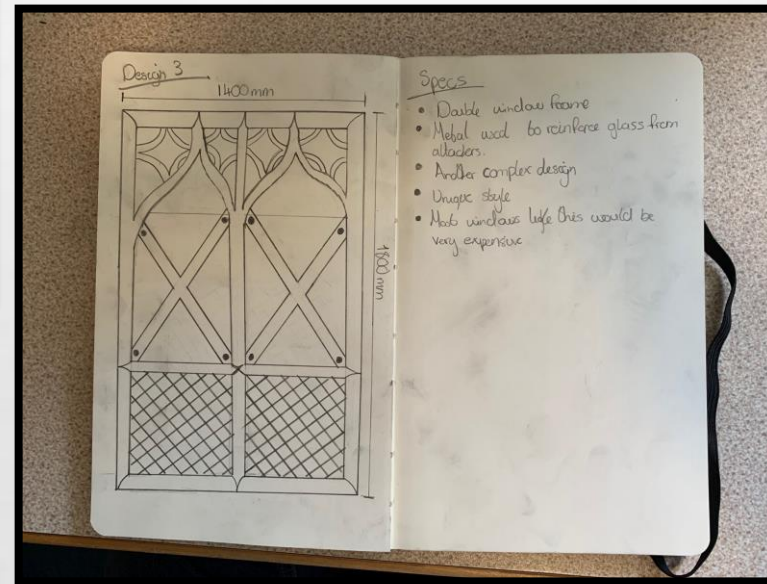
Mood Board

INITIAL DESIGNS



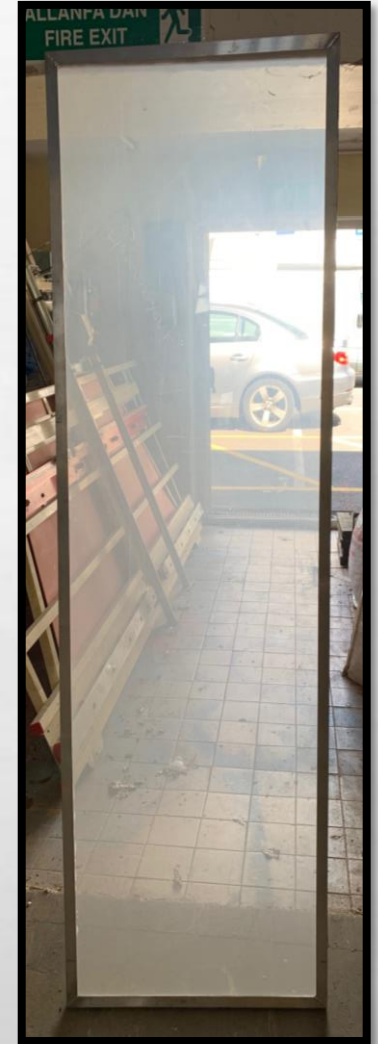
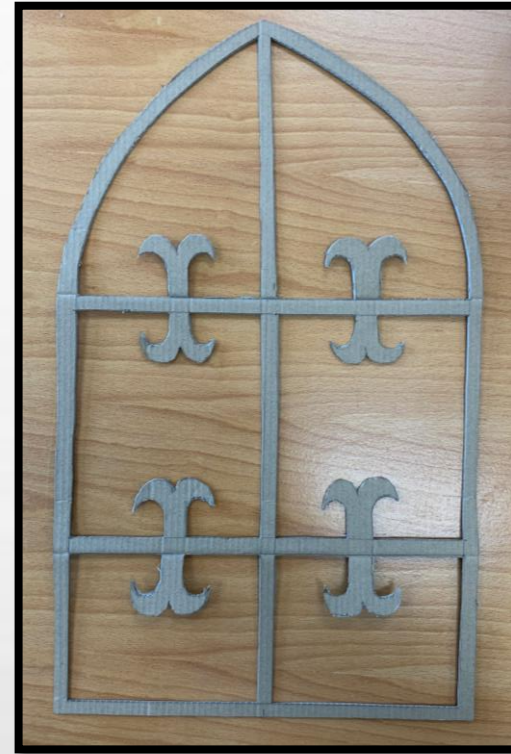
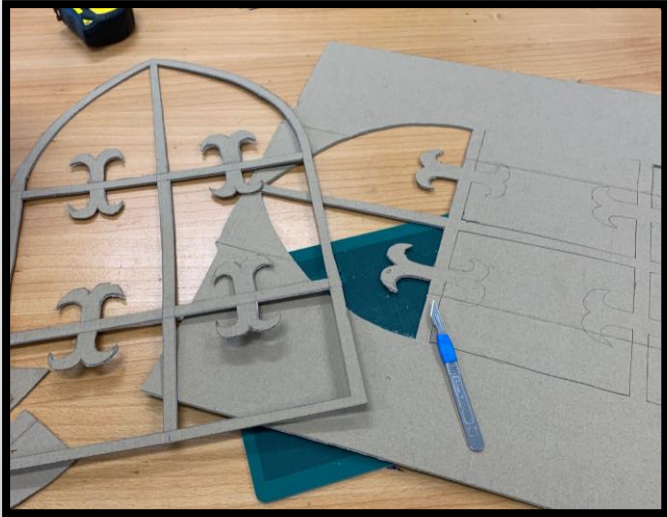
Window Designs

Stage Designs



PROTOTYPES

For my idea I wanted to do the kings death scene. This scene takes place inside a castle, but I wanted to add an aspect of projection that would last throughout the scene. After brainstorming a few Ideas I finally came up with the idea of projecting the weather into a window in the kings bedroom. The window will be a constant loop of the weather. I decided to make a prototype of the window that would be used on set. The glass I will be using has a special type of gel infused in it that allows it to handle projections



FINAL PROTOTYPES



MY VIDEOS AND OTHER RESEARCH

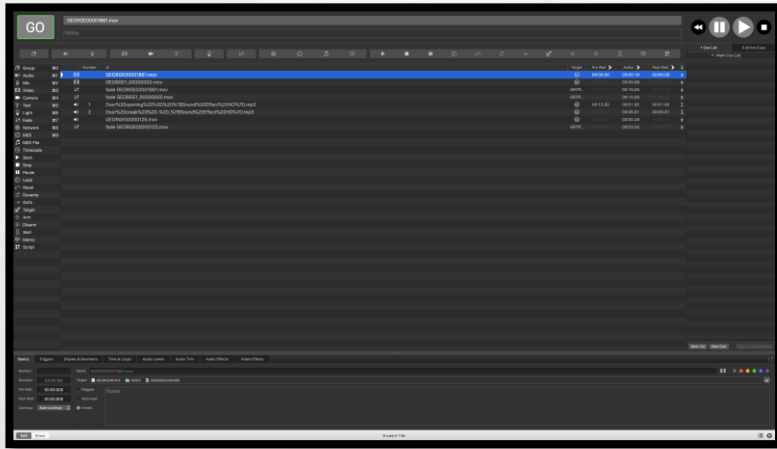
Castle bedroom

- Medieval beds were made from white poplar wood and well-seasoned with a walnut veneer.
- <https://www.medievalists.net/2015/08/what-a-medieval-bed-should-look-like/>
- Flags on the wall
- Weapons over the mantel piece
- Beautiful long curtains.
- Cold stone walls
- Torches on the wall
- Candle stands

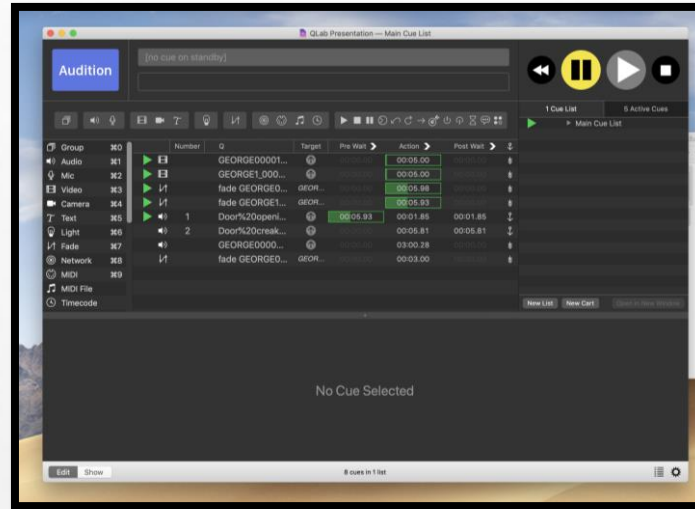
Sound/ Videos I will use in my presentation

- Crackling Fire https://youtu.be/UgHKb_7884o
- Creaking door <https://youtu.be/lvJQTWGP5Fg>
- Footsteps <https://youtu.be/vX8sbqk007Q>
- Thunder and Lightning <https://youtu.be/vX8sbqk007Q>
- Rain <https://youtu.be/q76bMs-NwRk>
- Wind <https://youtu.be/sT5f1jBJHng>
- Room noise <https://youtu.be/lvJQTWGP5Fg>

QLAB WORK

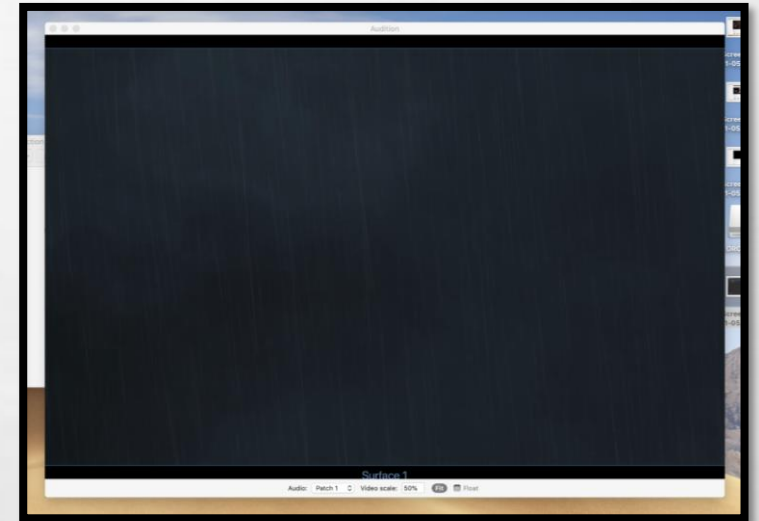


Editing My Presentation



Presentation Playing

Video of Presentation



For my idea I wanted to do the kings death scene. This scene takes place inside a castle, but I wanted to add an aspect of projection that would last throughout the scene. After brainstorming a few Ideas I finally came up with the idea of projecting the weather into a window in the kings bedroom. Included sound effects like an old castle door opening and closing, as well as the sound effect of a crackling fire which would rise in volume as soon as the door had closed.