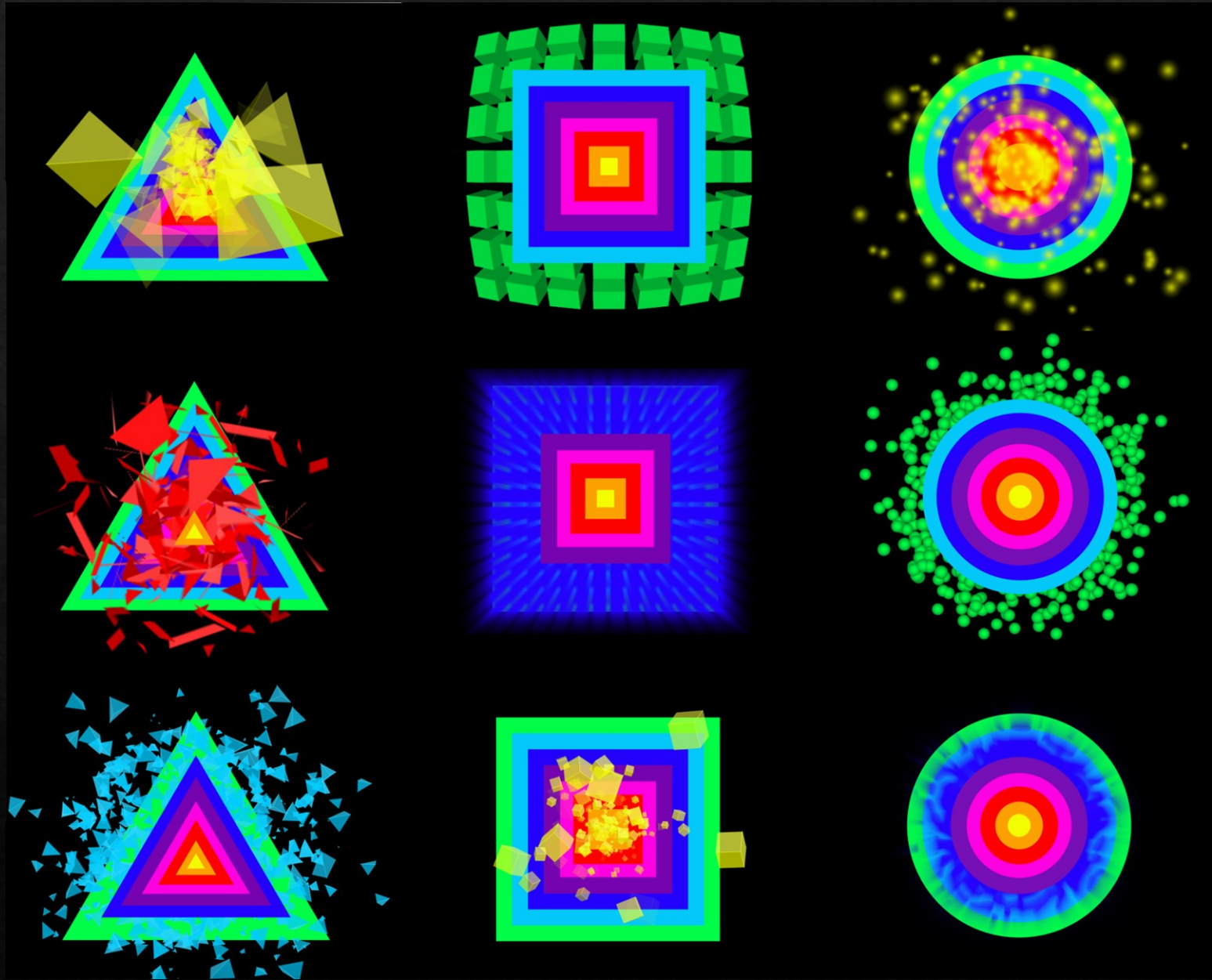




# Video Art Design

Jelena Rubil

8 session



# Technical Problem-Solving

## Safety and Regulations

Ability to troubleshoot technical issues related to video equipment, software, or playback systems during rehearsals and performances.

Health and Safety: Ensuring that video equipment and installations comply with safety regulations and do not pose any hazards to performers or audience members.



Video cues and troubleshooting technical issues during rehearsals and performances to ensure seamless execution of video content.

Ability to troubleshoot technical issues related to video equipment, software, or playback systems during rehearsals and performances.

## Troubleshooting

Develop a comprehensive understanding of common technical issues that may arise with video equipment, software, and playback systems in theatrical productions, including connectivity issues, compatibility issues, and software glitches.

Acquire proficiency in diagnosing and troubleshooting technical problems efficiently and effectively during rehearsals and performances, utilizing systematic troubleshooting techniques, diagnostic tools, and problem-solving strategies.

Practice proactive problem-solving and contingency planning to anticipate potential technical challenges, develop backup plans, and implement quick solutions to minimize disruptions and ensure uninterrupted video playback and performance.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

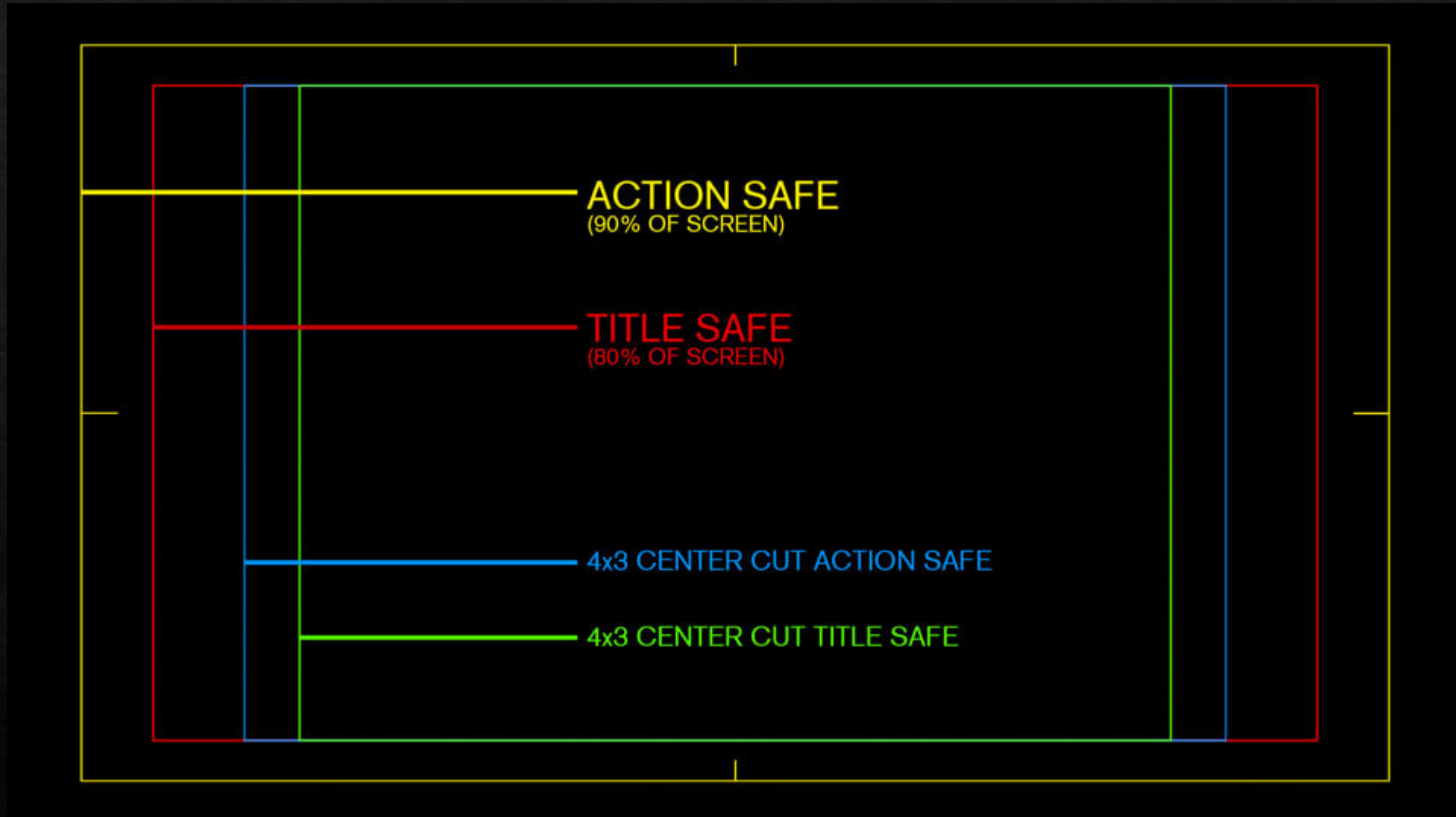


Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment



Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.



RESOLUTION	PIXELS HORIZONTALLY	PIXELS VERTICALLY	TOTAL PIXELS
<b>Video Resolution (4:3 aspect ratio)</b>			
SVGA	800	600	480,000
XGA	1024	768	786,000
SXGA	1400	1050	1,470,000
UXGA	1600	1200	1,920,000
<b>Widescreen Resolution (16:10 aspect ratio)</b>			
WXGA	1280	800	1,024,000
WXGA+	1440	900	1,296,000
WUXGA	1920	1200	2,304,000
<b>Widescreen Resolution (16:9 aspect ratio)</b>			
720p	1280	720	921,600
1080p	1920	1080	2,073,600
4K Ultra HD	3840	2160	8,294,400
8K Ultra HD	7680	4320	33,177,600
<b>Widescreen Resolution (17:9 aspect ratio)</b>			

# DISPLAY ASPECT RATIOS

**3:2**

35 mm film,  
DSLR Camera,  
Smartphones

**4:3**

SDTV/Video  
Computer displays

**5:4**

Computer  
Displays

**16:10**

Widescreen computer  
displays, smartphones  
(Horizontal)

**16:9**

HDTV, Widescreen  
SDTV, smartphones  
(Horizontal)

**1:85:1**

Cinema film (US)

**2:35:1**

Cinemascope

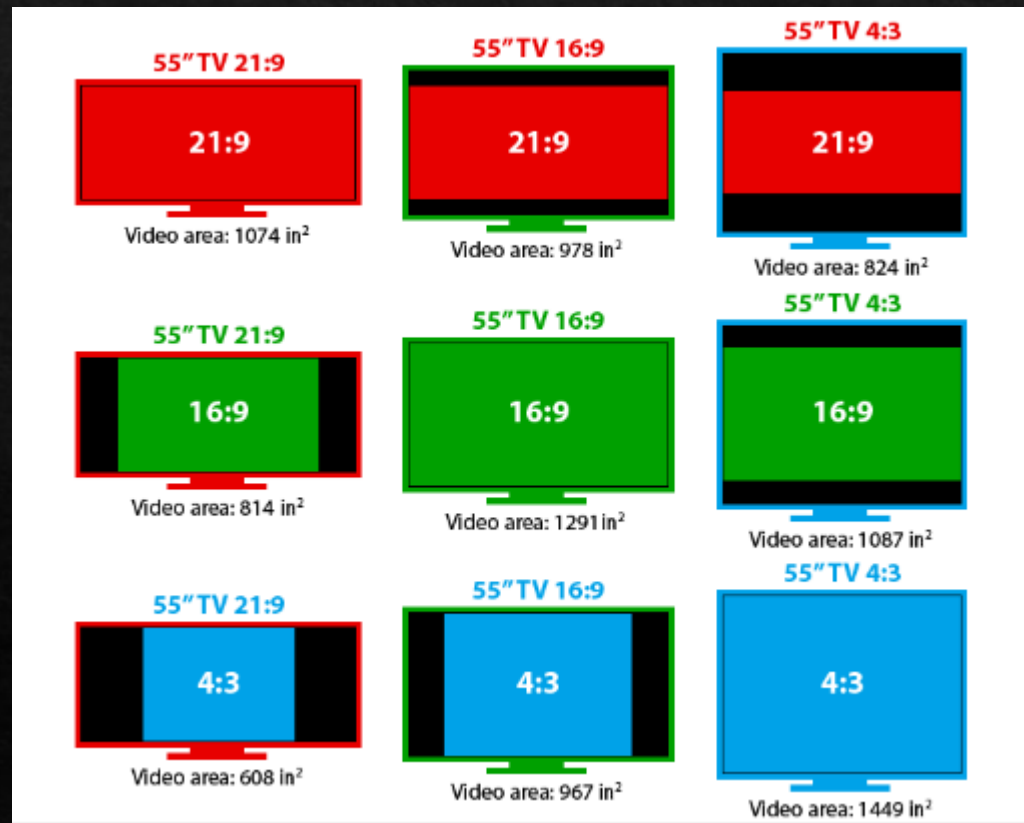
**9:16**

Smartphones  
(Vertical)



Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

The aspect ratio is the ratio between the width and the height of a display. It defines its overall shape, and it is usually presented as W:H (where W is the width, and H is the height).



Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.



## Projector:

Popularly known for their abilities to create images by shining a light through a transparent, miniature lens, Projectors are optical devices that project image on any surface.

The surface on which a projector is normally made to project images is called the projector screen. They are also well known as image projectors, and in recent inventions, the projectors do not even require lenses.

They project the image directly on the surface with the help of lasers.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### Some of the Popular Types of Projectors:

Based on their applications, Projectors are normally classified into many types.

Some of the well known types include:

- 4k Projector
- LED Projector
- LCD Projector
- Nebula Projector
- Laser Projector
- DLP Projector
- Light Projector
- Mini Ray Projector
- Pocket Projector
- Optoma Projector
- Projector TV
- Video Projector
- Movie Projector
- Short Throw Projector
- Classroom Projector
- Film Projector
- Laser Light Projector
- Mini Projector and much more.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment



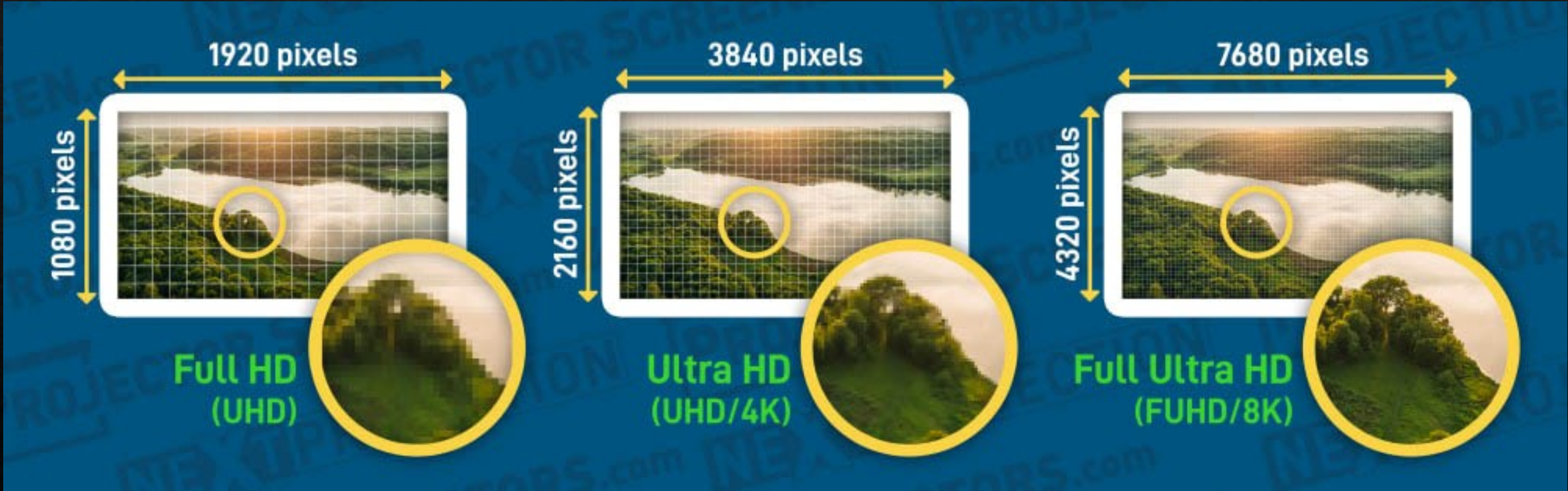
Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

Equipment



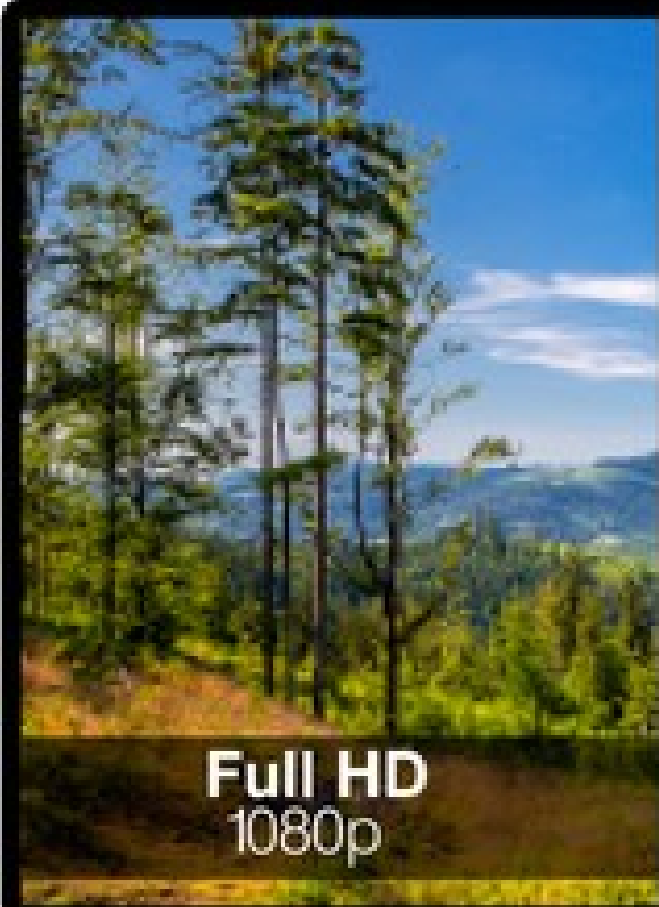
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Equipment

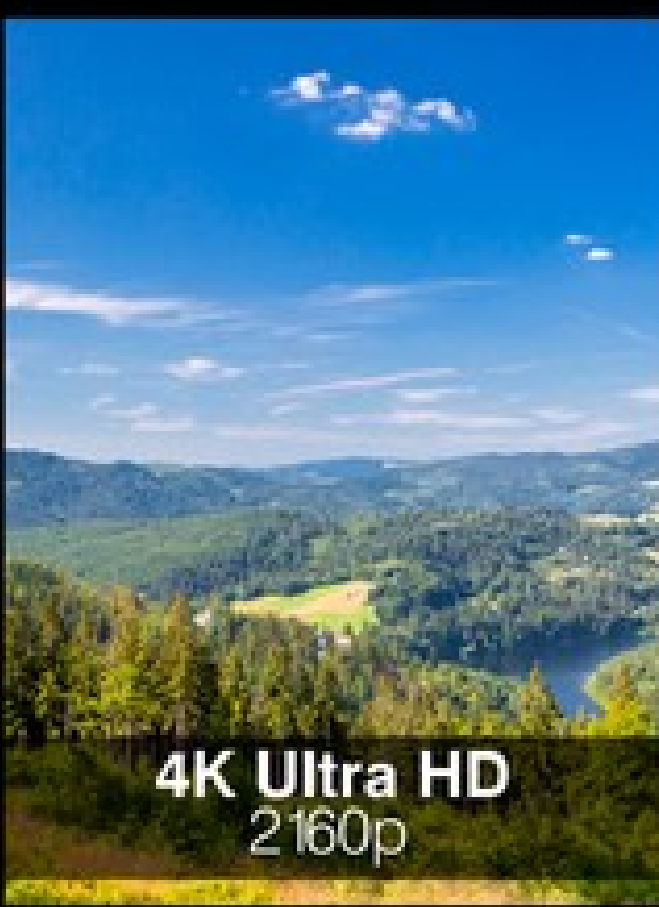


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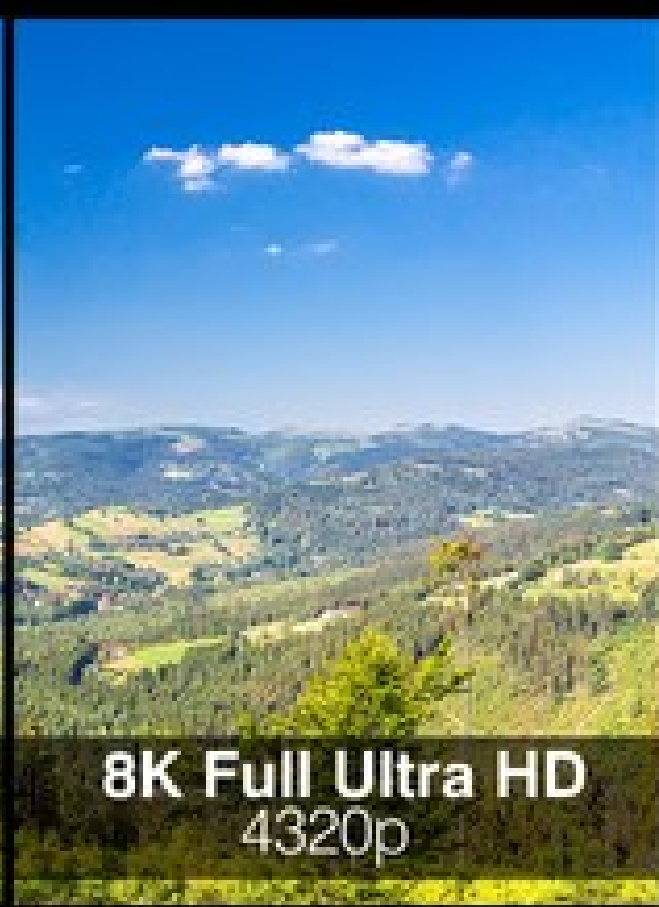
Equipment



**Full HD**  
1080p



**4K Ultra HD**  
2160p



**8K Full Ultra HD**  
4320p

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment





Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.



Equipment

Adjusting projector settings

Projector Setup Settings - Extended Menu

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### Types of Projectors and their Features:

#### **4K Projector:**

With USB Hardware Interface and 4K resolution, 4K projectors are one of the most sought after types of Projectors. They can be connected to devices through Bluetooth, Wi-Fi, and USB and have inbuilt DLP display technology. They are portable and weigh about 865 grams. They do not require batteries and their mounting type is ceiling mount. They are commonly used as home theatre projectors.

#### **LED Projectors:**

LED Projectors are easily connectable to devices like mobiles, laptops and much more. They are equipped with LED light Projections, that make sure that the image or video projected is clear with high quality resolutions. They are high quality projectors that use LED to project images and stuff. They can be operated with a remote and have improved LED lamp life. They are also ceiling mountable and portable. Some of the Advanced models even have a reduced noise fan, that can reduce the noise by half.

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## Equipment

### **LCD Projector:**

LCD Projectors, also popularly known as the modern replacements of Slide or Overhead Projectors, is one of the types of video projectors that display video and images on a projector screen or any other flat surface.

They normally produce less contrast outputs and require filter maintenance. It consists of a lamp, three liquid crystal panels, filters and a prism, which are required to create the image on the screen. They have great production of color and are highly affordable. They are commonly for professional purposes like presentations, seminars and meetings.

### **Nebula Projector:**

A Nebula Projector is a mini, portable projector that normally works in three different ways. Sometimes they work as a standalone projector, where apps can be downloaded and streamed right through with the use of Wifi. They are available wireless and sometimes wired with HDMI Cable.

Inbuilt speakers, a resolution of 1080 pixels are some of the highlighted features of Nebula Projectors. Nebula Projectors can be easily noted as one of the best projectors in the world, with their Android Features and sound features. They are portable and lightweight too at affordable rates.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### **Laser Projectors:**

Having greater contrast than lamp projectors, Laser Projectors don't require inside the projector unit since they run at a low temperature. The lamp life of the Laser Projectors determine their life span. They are low maintenance and project true to life colours.

A Laser Projector created images and videos by changing the laser beams on the screen. They are highly suitable for educational environments. New models even have voice assistants and easy image setups.

### **DLP Projector:**

DLP Projector actually means Digital Light Processing Projectors, where the light beams are passed through colour wheels, Reflection mirrors and finally a lens. The DLP chip, which was commonly known as a digital micromirror device (DMD), is the device that differentiates DLP from Laser Projectors. They are known to be highly reliable, lightweight and portable.

### **Light Projector:**

Unlike other models and types, Light Projectors are quite unusual from their types. While other projectors are used to project images, Light Projectors are used for home decor purposes and to project decorative lights. New models of Light Projectors have voice control, timers, and speakers too. Brightness can be controlled and they are automated to project certain patterns of light, based on the settings people set. The desired light projections can be set by just a few twists and turns. They are normally used in parties and special occasions.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### **Mini Ray Projector:**

Suiting their name, Mini Projectors are miniature, Portable Projectors with a weight of approximately 30g. Their normal screen rate is 16:9 and can be used in Window OS, Mac OS and even Android 5.0. They are the miniature versions of normal projectors, yet the features never tend to miss the mark.

### **Pocket Projector:**

Otherwise widely known by a variety of names like handheld projector, mobile projector, pico projector and mini beamer, Pocket Projectors are image projectors that are made into handheld devices. The hardware and software are miniaturized to fit the pocket projector and can be used to project images. They are similar to mini projectors and have the same working principles and outputs.

### **Optoma Projectors:**

Producing Projectors with exceptional features and quality, Optoma still stays in the leading list of companies that produce the best professional projectors. They are used comfortably in fields of business and education and even for domestic entertainment purposes.

They have great colors, perfectly designed for gaming and entertainment like watching shows and movies. They are equipped with a short throw lens, and deliver low lag time. They are popularly known for their 4K projectors and are known for their video and audio accessories, and they are also compatible with 3D players.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### **Projector TV:**

Just by switching your TV with a projector screen with a 4k resolution projector with ultra sound effects, Projector TVs can be created. Unlike TVs, they are more wide screened with great sound effects. The projector is connected to the required device or WiFi, and the movie or video you wish to see is selected and projected.

Smart Projector Tvs are now found in the market, with new voice control and smart options. They are affordable and offer the buyer a great entertainment experience with its wide screen and great sound effects. They can also be projected on flat walls, by adjusting the size of the projected video to fit the wall.

### **12.Video Projectors:**

Available in HD, LED,LCD, and 4k resolutions too, Video Projectors are one of the commonly bought projectors. They are used to display videos in bright colours and high qualities, streamed through WiFi, or connected to devices through Bluetooth or USB.

They are also available in Laser modes, and are lightweight and portable. They are used in both domestic and professional environments for entertainment videos and professional options too. They can also be used for gaming pastimes.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### **Movie Projector:**

Not much different from other models of projectors, Movie Projectors are strictly 1080 P, since they are solely used for the purpose of projecting movies. Though their working methods and construction is the same as its other projector companion, they have a better sound and display clarity. They can be LCD, LED or even Laser. They are normally used in theatres to project movies in widescreen or at homes to build a home theatre.

### **Short Throw Projector:**

With a throw ratio of less than 0.4, Ultra Short Throw (UST) has a wide angle lens. They are easy to install and are placed just under the screen, hence the presenter cannot hide the rays emitted from the projector, avoiding shadows being created on the image.

They are not ceiling mount ,hence they avoid the cost and hassle of ceiling mount projectors. They are also highly affordable. They are found in HD, built to emit with laser rays.

### **Classroom Project:**

Just like their name denotes, Classroom projectors are used for educational purposes and highly used in professional environments. They are available in ceiling mount models, and also wired or wireless. They can be connected to devices like laptops and stuff with Wifi or through Bluetooth.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

### **Film Projector:**

Just like film movie projectors, film projectors are used to display and project high quality videos or movies with bass sound effects. They are controllable with remotes.

### **Laser Light Projector:**

Laser Light Projectors have inbuilt laser light emitters that are used to display videos or images with laser light. They can be used to special effects, lighting, house decor, and can also be used to project images and videos.

Portable, affordable, and lightweight they are known to be multi purpose and are highly popular and being developed everyday with new creations.

### **Mini Projectors:**

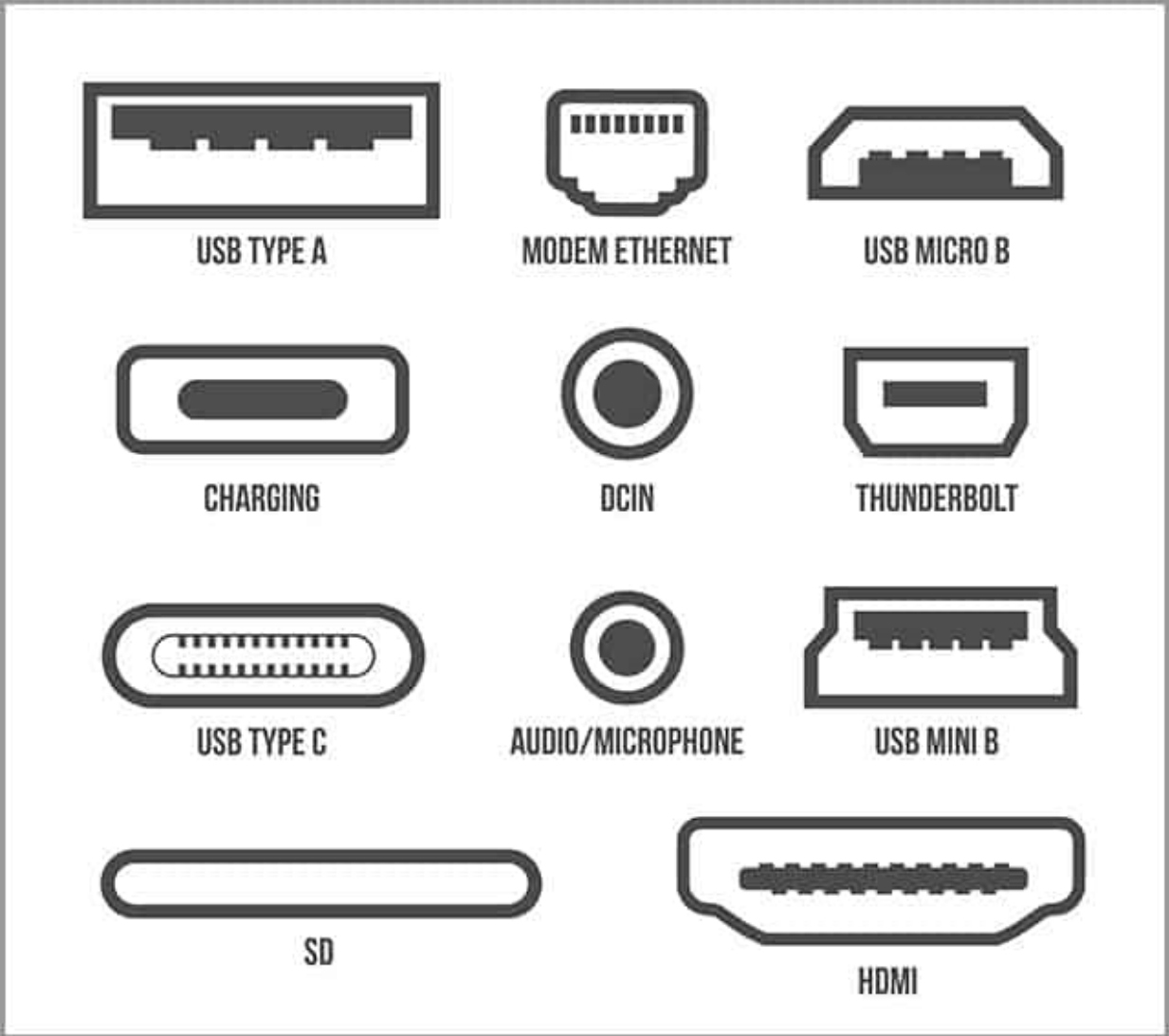
Being one of the versatile yet much sought after designs, mini projectors are the miniature versions of normal projectors. They are perfectly portable, affordable, and compact in size.

Projectors, being one of the best inventions of the century, are found in many specifications with great features. If you want great clarity and sound with wide screens, Projector is the perfect choice. Buy the best projector for your money's worth and enjoy the best entertainment and professional experience by watching videos and images in HD.



Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

Equipment



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Equipment











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## Equipment

Plug (Male)	Socket (Female)	Name	Format/Use	Found On
		<b>Type A</b> 13.9mm x 4.45mm	<b>Digital Video + Audio (&amp; Ethernet v1.4)</b>  HDMI is the latest commercial standard for high-definition digital video and audio signals in the one connection.	Modern Televisions, Monitors, Laptops, Blu-ray, DVD, PVR, Projectors, X-Box 360, PS3, Personal Computers & more!
		<b>Type C (Mini HDMI)</b> 10.42mm x 2.42mm	v1.3 cables are capable of current-generation high-definition and 3D output, while v1.4 will cater to the next-gen 2k x 4k super-high definition and even better 3D signals along with wired network support.	Camcorders, Digital Cameras, Notebooks, Tablet PCs and other small A/V devices.
		<b>Type D (Micro HDMI)</b> 6.4mm x 2.8mm		Tablet PCs, Camcorders, Digital Cameras and other miniaturized A/V devices.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## Equipment

Plug (Male)	Socket (Female)	Name	Format/Use	Found On
		<b>DVI-A</b> (Analogue) 25mm x 8mm	<b>Digital or Analogue Video</b>  Signals are compatible with both VGA (analogue) and HDMI (digital) for easy conversion.	Personal Computers, Monitors & Televisions.
		<b>DVI-D Dual Link</b> (Digital) 25mm x 8mm	This is the only common standard that includes both digital and analogue signals. Connectors can range from 12+5 to 24+5 pins.	Personal Computers, Monitors & Televisions.
		<b>DVI-I Dual Link</b> (Integrated Analogue and Digital) 25mm x 8mm	<b>The flat pin on a DVI-I male connector is wider than the same pin on a DVI-D connector.</b>	Personal Computers, Monitors & Televisions.
		<b>Mini DVI</b> (Integrated Analogue and Digital) 11.2mm x 7.1mm	<b>Digital or Analogue Video</b>  Supports up to 1920x1200 resolution for compatibility with HDMI, VGA and DVI (single link) Replaced by Mini-DisplayPort	Select Apple computers and laptops

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

Equipment



Health and Safety: Ensuring that video equipment and installations comply with safety regulations and do not pose any hazards to performers or audience members.

## Safety and Regulations

6.1.1 Understand the relevant safety regulations and guidelines applicable to video equipment and installations in theatrical productions, including electrical safety, fire safety, and structural stability requirements.

6.1.2 Learn how to conduct comprehensive risk assessments for video equipment and installations, identifying potential hazards and implementing appropriate control measures to mitigate risks to performers, crew members, and audience members.

6.1.3 Develop protocols and procedures for safely installing, operating, and dismantling video equipment and installations in theatrical venues, including proper handling of cables, securing of fixtures, and emergency response protocols in the event of equipment malfunction or accidents.



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High-quality video footage

**Frame rate** is the measurement of how quickly a number of frames appears within a second

**PAL** video is composite video because luminance (luma, monochrome image) and chrominance (chroma, colour applied to the monochrome image) are transmitted together as one signal.

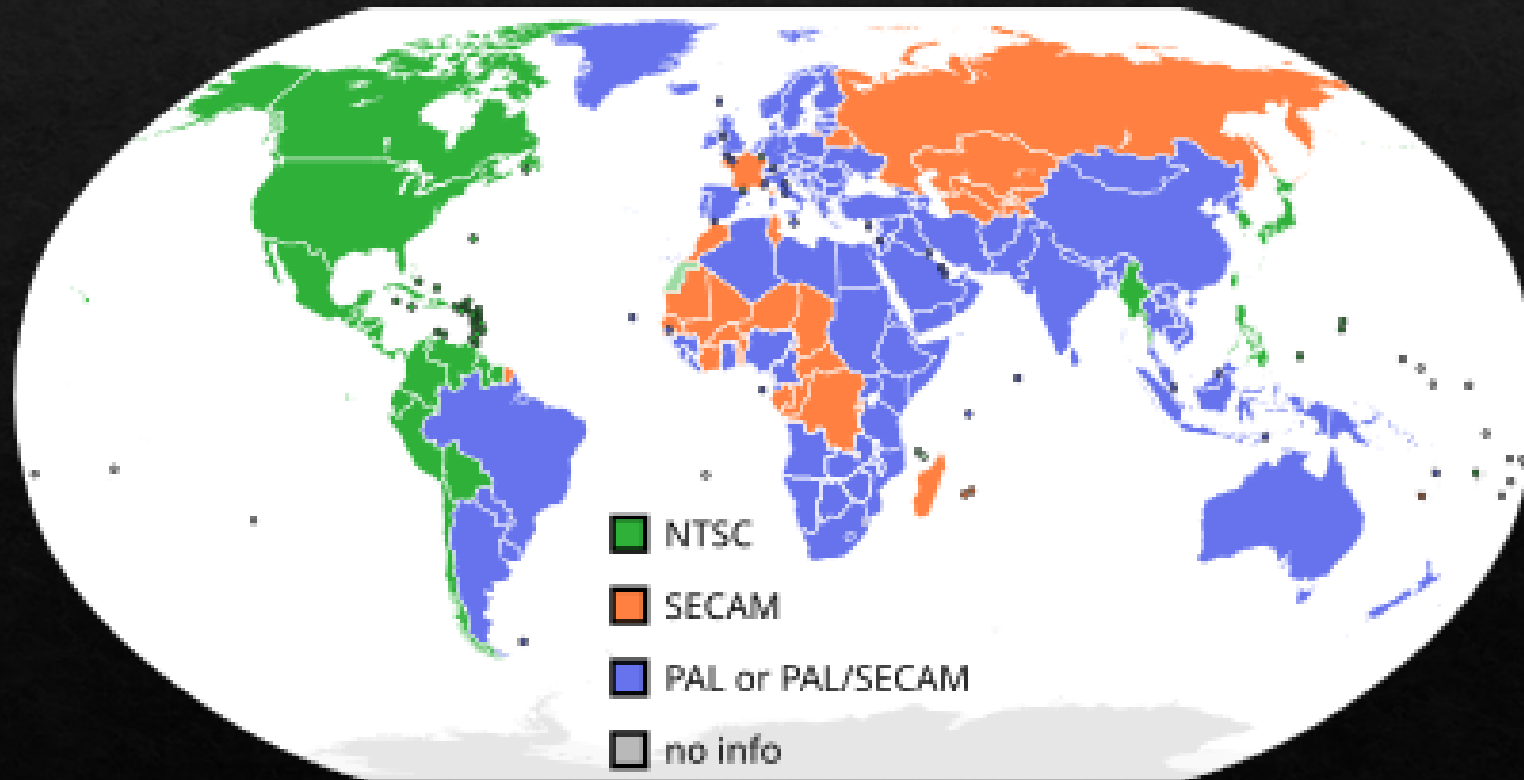
**PAL** is an abbreviation for Phase Alternate Line. This is the video format standard used in many European countries. A PAL picture is made up of 625 interlaced lines and is displayed at a rate of **25 frames per second**.

**SECAM** is an abbreviation for Sequential Color and Memory. This video format is used in many Eastern countries such as the USSR, China, Pakistan, France, and a few others. Like PAL, a SECAM picture is also made up of 625 interlaced lines and is displayed at a rate of **25 frames per second**. However, the way SECAM processes the color information, it is not compatible with the PAL video format standard.

**NTSC** is an abbreviation for National Television Standards Committee, named for the group that originally developed the black & white and subsequently color television system that is used in the United States, Japan and many other countries. An NTSC picture is made up of 525 interlaced lines and is displayed at a rate of **29.97 frames per second**.

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High-quality video footage



Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.



High-quality video footage

A **video file format** is a type of file format for storing digital video data on a computer system.

### Video file format and codec basics

Because video files can be large, programs called codecs were developed to make them easier to store and share. Codecs encode data to compress it for storing and sharing. Then they decode that data to decompress it for viewing and editing. The most common codec for video compression is

**H.264.**

Audio file formats or file extensions are the containers or wrappers for these codecs. As with lossy audio file formats, most video formats lose data in compression. Which format you choose depends on the balance you want to strike between quality and ease of use.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

## High-quality video footage

A **video file format** is a type of file format for storing digital video data on a computer system.

**MP4** (MPEG-4 Part 14) is the most common type of video file format. Apple's preferred format, MP4 can play on most other devices as well. It uses the MPEG-4 encoding algorithm to store video and audio files and text, but it offers lower definition than some others. MP4 works well for videos posted on YouTube, Facebook, Twitter, and Instagram.

**MOV** (QuickTime Movie) stores high-quality video, audio, and effects, but these files tend to be quite large. Developed for QuickTime Player by Apple, MOV files use MPEG-4 encoding to play in QuickTime for Windows. MOV is supported by Facebook and YouTube, and it works well for TV viewing.

**WMV** (Windows Media Viewer) files offer good video quality and large file size like MOV. Microsoft developed WMV for Windows Media Player. YouTube supports WMV, and Apple users can view these videos, but they must download Windows Media Player for Apple. Keep in mind you can't select your own aspect ratio in WMV.

**AVI** (Audio Video Interleave) works with nearly every web browser on Windows, Mac, and Linux machines. Developed by Microsoft, AVI offers the highest quality but also large file sizes. It is supported by YouTube and works well for TV viewing.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.



High-quality video footage

### What is video **bitrate**?

Every second of video is packed with digital information. It could be a lot of information, like the high image quality of 4K video on physical media. Or less information, such as live streaming social media video from a phone with lower video and audio quality. Those two types of videos have a very different amount of data. The amount of information per second in video is known as bitrate.

“Bitrate refers to depth of information, whether in video or audio.

Bitrate is distinct from other measurements of video quality such as **frame rate, resolution, or video format**. Those factors represent specific things about the nature of the footage, such as frames per second or how large the image is. Bitrate is more fundamental.

Develop proficiency in operating digital video equipment, including cameras, camcorders, and accessories, to capture high-quality video footage with proper exposure, focus, and composition.

High-quality  
video footage

What is video **bitrate**?

Bitrate encoding can vary a good deal given types of footage. On the **low end, 720p** is the type of video common in older HD televisions. 720p has a bitrate of about 6.5Mbps at a standard frame rate (24–30 frames per second) or 9.5Mbps on a high frame rate (48–60fps).

High-resolution **4K video encodes at 2160p** and has a bitrate between 44 and 56Mbps on a low frame rate and 65 to 85Mbps with a high frame rate. That higher quality footage will look great, but the level of quality and usability are often at odds with each other.

Explore advanced skills in video editing using software

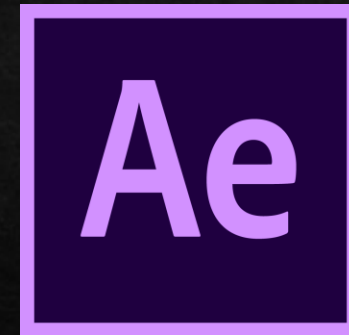
Video editing software



Final cut




















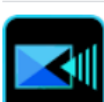


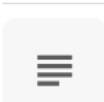
Adobe Premier



Adobe After Effects

## Explore advanced skills in video editing using software


Free video editing software

 DaVinci Resolve	 iMovie	 Shotcut
 HitFilm Pro	 Lightworks	 OpenShot
 VSDC Free Video Editor	 Adobe Premiere Rush	 VideoPad
 Clipchamp	 KineMaster	 VideoProc Vlogger
 Blender	 Kdenlive	 ACDSee Luxea Video Edit...
 ActivePresenter	 Kapwing	 PowerDirector
 Video Grabber	 Vimeo Create	 WeVideo



Projection mapping software and techniques to map video

## Projection Mapping



**MadMapper**  
The mapping software

<https://madmapper.com/>



<https://resolume.com/software>



**TOUCHDESIGNER**  
BY DERIVATIVE

<https://derivative.ca/feature/projection-mapping/14>

## Projection mapping software and techniques to map video

### Projection Mapping

You can also find free softwares.

#### 1. MapMap

A free, open-source video mapping software designed for real-time projection mapping.

Supports multiple video inputs and outputs.

Simple and easy to use, great for beginners.

#### 2. Blender (with Add-ons)

Blender is a powerful open-source 3D creation suite that can also be used for projection mapping with certain add-ons.

Add-ons like **BlendAr** or **Project Mapping Tools** can enhance its mapping capabilities.

Ideal for more advanced users who want to integrate 3D elements into projection mapping.

#### 3. MadMapper (Trial Version)

Although it's a paid software, MadMapper offers a free demo version with some limitations.

It's highly popular in the projection mapping community for its ease of use and powerful features.

#### 4. VDMX (Trial Version)

A versatile software for real-time video mixing and mapping.

It offers a free trial version with access to many of its core features.



# Video Art Design

Jelena Rubil

