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1. Pixels, Image and Video:

What are Pixels:

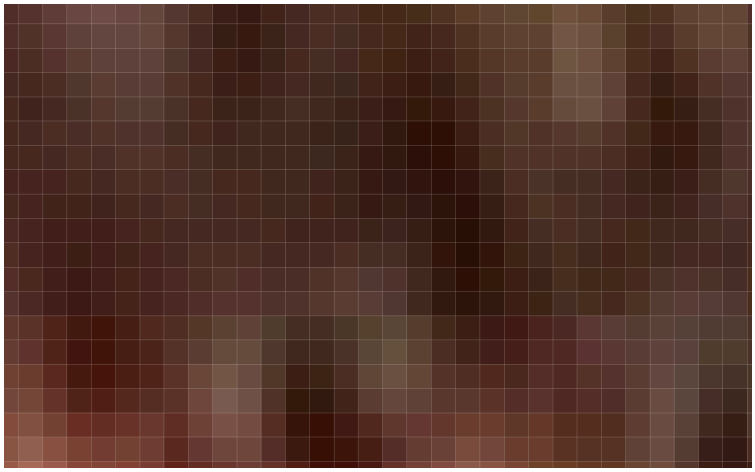
💡 Pixels means the no. of individual dots (dots are either in the form of square or rectangle) in a particular image or video.

The pixels are so small that they cannot be seen with the naked eye we can only see it by zooming the image or going too close to the source it.

The more the dots or pixels the better the quality of the image and visa-versa.

- Each pixel in the image contains information about the brightness and colors of the image or video.
- Pixels were made of 3 colors (Red, Green, and Blue) and they use these 3 main color to create different color in the image.

> The more the Pixels Per Each (PPI) in a format the better the quality.



Standards for Images and Camera Settings:

- We have 72 PPI for web-based images and 300 PPI for printing images.
- **Color Depth**: Refers to how many colors each pixel can represent. Common depths include **8-bit (256 colors)**, **16-bit**, and **24-bit RGB (16.7 million colors)**.
- **Raster-Based**: Uses pixels, is resolution-dependent, and loses quality when resized. Ideal for photos. Example: *Adobe Photoshop*. Because the no. of dots in the image is fixed in nature we cannot increase the no. of dots.
- **Vector-Based**: Uses mathematical paths (means lines, and shapes which are used to make any graphics) is resolution-independent, and maintains quality when resized. Ideal for logos and scalable graphics. Example: *Adobe Illustrator*. (It maintained quality when resizing because as the image was

resized; the content in the image like color and other things also expanded as per the expansion of the lines and curves).

- Because the content in the image depends on its outline, such as lines and curves, and not on the number of pixels, the outline of the image is like an elastic rubber band that can be expanded to any length.
- In the camera, the 12 MP (means the camera captures roughly 12 million pixels). Same as for 24,64 MP etc.

What is an Image?

💡 An image is a combination of multiple pixels which create a whole representation of the image.

What is Video?

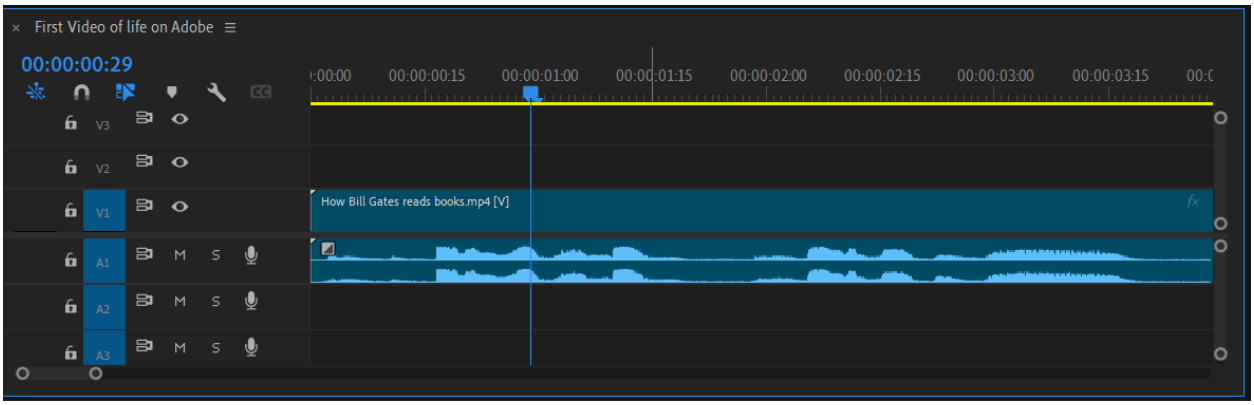
💡 A video is the arrangement of the different photos clicked by the camera per second and then the camera arranges those photos in the sequences; which gives us video.

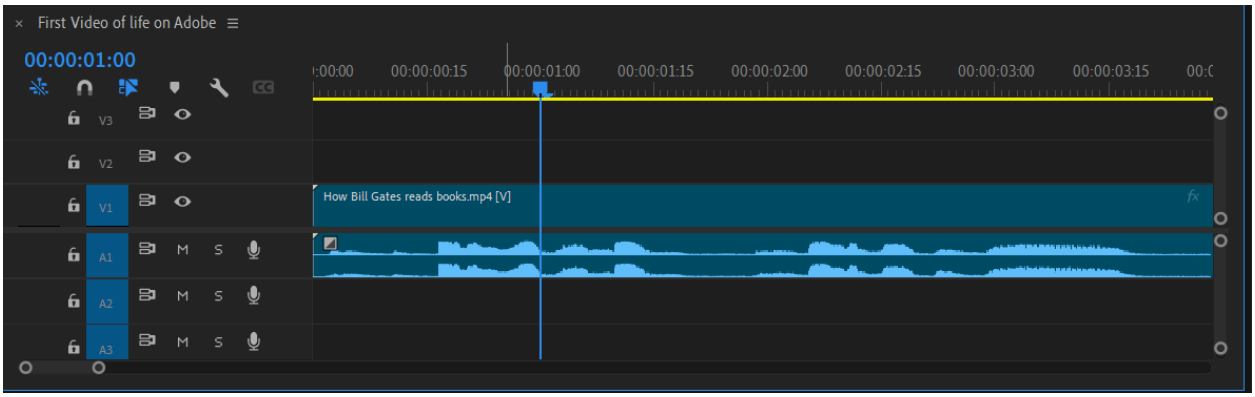
FPS: Frames per second. (Means no. of images per second captured by camera).

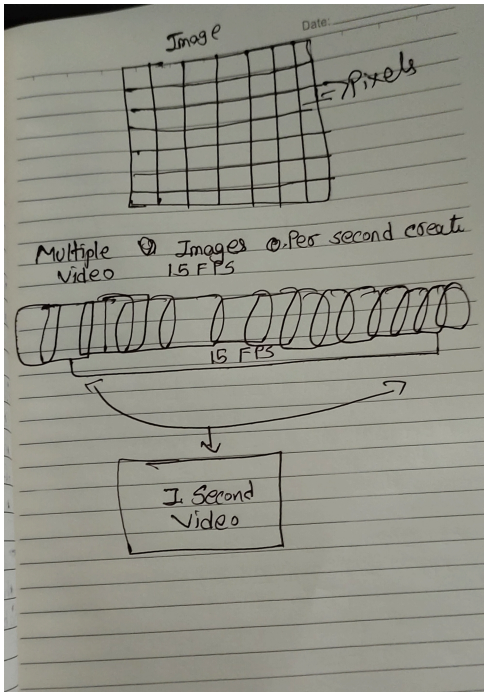
Time-Out In Video?

💡 If the video is on the 25 psf rate then in every 25 frames 1 Second is created and if the video is on the 30 psf then in every 30 frames 1 second is created.

https://www.youtube.com/watch?v=TP8wre-Mm1k&list=PLW-zSkCnZ-gABGZU8--ISUauyewG40Yex&index=2







2. Aspect Ratio and Resolution:

Aspect Ratio:

💡 This refers to the proportional relationship between the width and height of a video frame. It’s expressed as two numbers separated by a colon, like 16:9 or 4:3.

Resolution:

💡 This refers to the number of pixels in the video frame, which affects its level of detail. It's usually given as width x height (e.g., 1920×1080).

Resolution	Aspect Ratio	Common Use
1280 x 720 (720p)	16:9	HD, streaming, lower-end devices
1920 x 1080 (1080p)	16:9	Full HD, YouTube, movies
2560 x 1440 (1440p)	16:9	Quad HD, gaming monitors
3840 x 2160 (4K)	16:9	Ultra HD, 4K TVs, professional video production
7680 x 4320 (8K)	16:9	8K TVs, high-end production
640 x 480 (480p)	4:3	Standard definition (older content)
2048 x 1080 (2K)	17:9	Cinema, digital movie production
4096 x 2160 (DCI 4K)	17:9	Cinema, digital movie theaters
2560 x 1080 (Ultra-Wide)	21:9	Cinematic, ultra-wide monitors

Global Standard of Frame Rate:

1. Pakistan, India, the Middle East, and European countries follow the PAL standard (Phase Alteration Line) which has a 25 psf rate. (This means the camera captures 25 images per second).
2. Conversely, countries like North America and others follow NTSC (National Television System Committee) which has a 30 psf rate.

> This is needed when we are editing the video and want to change the sequence setting.

The Resolution of Video (Standards):

1. The PAL standard quality is 720 px by 576 px.
2. And NTSC's standard quality is 720 px by 480 px.
3. But currently, we have arrived at the HD and the resolution for that is 720 px (Height) by 1080 px like YouTube.
4. For the Full HD, it became 1920 px by 1080 px.

Why the 16:9 Ratio in today’s time is common:

💡 **In summary:**

-It gives a cinematic experience like a cinema hall in the device itself.

-The 16:9 ratio is closer to the natural field of view for the human eye.

-It is very easy and less costly to create device screens with a 16:9 ratio.

1. Historical Evolution from Film and TV

- Early **television** screens were mostly **4:3** (a nearly square shape). As **widescreen cinema** formats gained popularity in the 1950s, TV makers started thinking about how to bring a similar cinematic feel to home viewing.

- In the 1980s, engineers at **Sony** and **Panasonic** started developing **widescreen** television sets. They arrived at the **16:9** ratio as a compromise between cinematic widescreen formats (which were often too wide for TV) and the traditional **4:3** TV ratio. The result was a balanced, visually pleasing ratio that worked well for both movies and standard television broadcasts.

2. Adoption by HDTV Standards

- In the late 1990s and early 2000s, when **high-definition (HD)** TVs were being developed, the **16:9** aspect ratio was chosen as the standard for **HDTV broadcasts**. This was partly to align with global broadcasting standards and also because it offered a more cinematic feel while remaining adaptable to TV and computer screens.
- The **ITU-R BT.709** standard, established by the **International Telecommunication Union**, defined **1080p (Full HD)** resolution at **1920 × 1080 pixels** with a **16:9 aspect ratio**. As **HD** content became more popular, the 16:9 ratio became ingrained in consumer expectations.

3. Versatility for Multiple Media Formats

- **16:9** offers a great balance for a wide range of content:
  - **Movies**: Many modern films are shot in **widescreen** formats, and 16:9 works well for these without excessive letterboxing (black bars at the top and bottom of the screen).
  - **TV Shows**: Most TV content is now produced in **16:9**, making it ideal for watching both TV shows and movies.
  - **Computer Monitors**: When computer monitors transitioned from 4:3 to widescreen formats, 16:9 was the natural choice. It's versatile for both **gaming** and general computer use.
  - **Smartphones**: Phones also adopted **16:9** or similar ratios because it worked well for both video playback and general apps.

4. Compatibility with 4K and Other Resolutions

- As **4K** (3840 × 2160) became more common, it retained the **16:9** aspect ratio. This kept consistency across HD and 4K content, meaning that content

produced for one resolution could easily be adapted to others without much loss of quality or visual consistency.

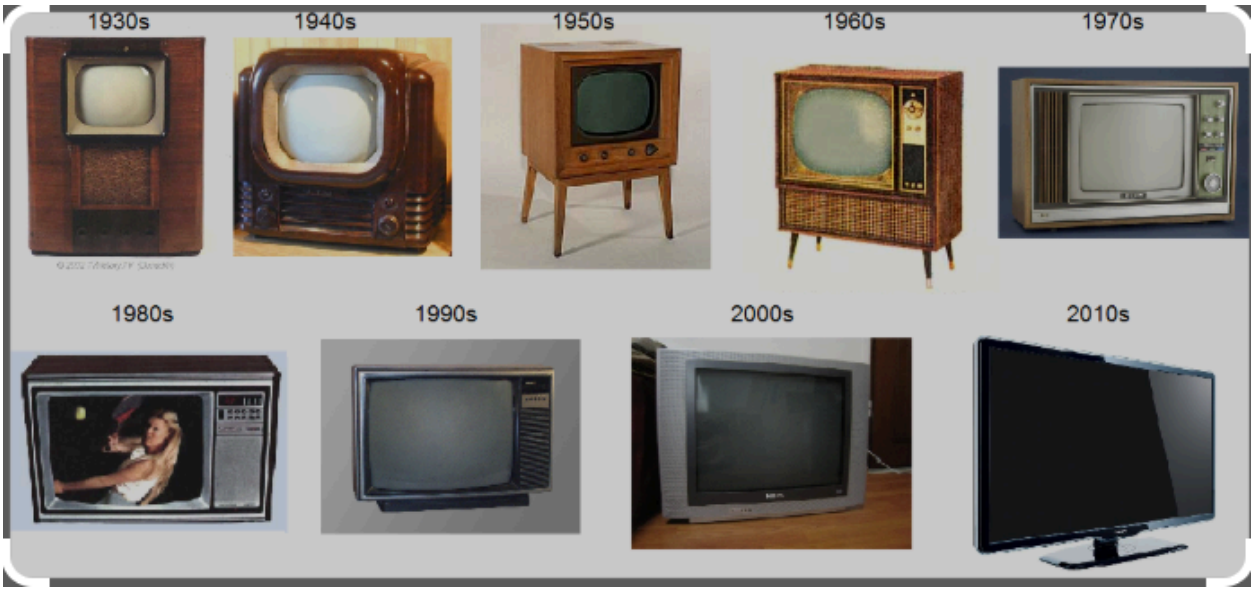
5. Consumer-Friendly

- The **16:9** aspect ratio strikes a nice balance between **cinematic immersion** (from widescreen) and **TV compatibility**. It works for a wide variety of content and is well-suited for both casual TV watching and high-definition content consumption.
- Additionally, **16:9** works better in modern **flat-panel TVs** and **computer monitors**, where screen real estate is important, and it allows for a more comfortable viewing experience in many setups.

6. Global Standardization

- The **16:9 aspect ratio** was widely adopted globally as part of the **HDTV standard**, meaning manufacturers and content producers all agreed on this common ratio for HD and 4K displays. This helped standardize content production and consumption across different media, making it easier for consumers to access and enjoy high-definition content from various sources (broadcast, streaming, DVDs, etc.).

💡 **Also, many modern TVs and mobile phones have technology that can upscale HD content (like 1080p) to 4K without significant pixelation. This process is called upscaling, and it’s particularly common in 4K televisions and high-end smartphones.**


1930s
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2010s


1984
Macintosh
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Macintosh Plus
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Macintosh II
1987
Macintosh SE
1989
Macintosh IIci
1989
Macintosh IIfx
1990
Macintosh Classic
1990
Macintosh IIsi
1990
Macintosh LC
1993
Macintosh Centris
1993
Macintosh TV
1995
Macintosh LC
1998
iMac
1999
iMac DV
2001
iMac Patterns
2002
iMac
2004
iMac G5
2006
iMac Slimmer Intel
2007
Novo iMac

3. Sound Design:

https://youtu.be/c0YINYT4Ozw?si=4KN58sXEYr9xgHv0

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🎧 Sound Design Basics:

In any video, movie, or web series, sound design typically consists of **three key elements**:

1. **Dialogue** – The voice or speech of the main character(s).
2. **Sound Effects (SFX)** – Sounds representing various actions or elements (e.g., paper rustling, clicking, footsteps).
3. **Background/Ambient Sound or Music** – Used to set the mood, fill silence, or enhance moments (e.g., intro music, emotional tone, or ambient noise).

🧪 Example:

1. **Dialogue** – Ganesh or Johnny is speaking.
2. **SFX** – Sounds like clicking, paper shuffling, etc., are added as supporting effects. Commonly used in informative content like the YAAS group videos.
3. **Music/Ambience** – Played during news segments, changing the tone of the video, opinion parts, or when introducing a side character to enhance storytelling.

4. The Cuts:

Watch different Cut videos on YouTube or the editing podcast for subconscious programming of brain.