

The mobile phone camera

Agenda

- Lenses, pixels and multiple cameras
- Holding the camera, framing, zooming and rule of thirds
- Adjusting the image on the phone
- Editing
- Exporting

What is a photo?

- All images on computers consist of rows and columns of tiny coloured dots which you can see if you zoom in enough, these are called pixels



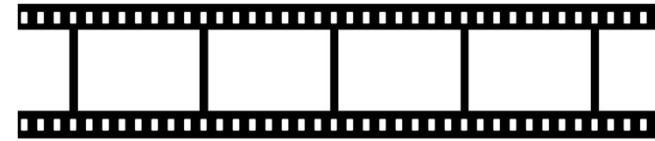
- An HD TV is 1920 pixels wide by 1080 high
- Ultra HD is 3840 * 2160



Image storage

- Typically images are captured at 300 dots per inch, i.e. a postcard sized image would need 1,350,000 dots!
- Consequently all images are stored using lossless compression to make them smaller these are usually named after the group that created them. Common formats are;
 - JPG, PEG - Joint Picture Experts Group, general purpose, most used on cameras
 - GIF - Graphics Interchange Format, best for small icons and animations.
 - PNG - Portable Network Graphic, supports transparent background so used for odd-shaped images
 - BMP - Microsoft Bitmap, rarely used today
 - HEIF - High Efficiency Image File Format, used on iPhones to support their advanced image features but not supported very well on PC – do not email these to anyone who may not have a Mac or iPhone

Video

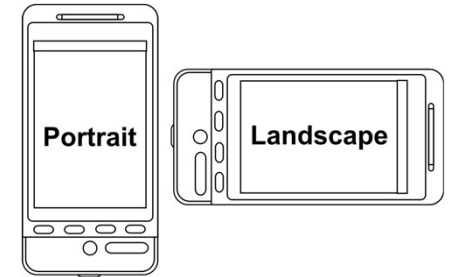


- A video is simply a sequence of still images, just like on a cine film
- Each frame is compressed by similar techniques as those for still images
- They are also compressed inter-frame – only the pixels that are different from the previous frame are stored
 - Compression is VERY efficient, only about 2% of the data captured in a TV camera ends up going to the satellite!
 - Compression is very compute intensive, even today it causes about a 2 second delay on TV signals
- Video is un-compressed when played.
- There are lots of formats, here are the most common
 - MPEG, MP4 Motion Picture Experts group – most often used
 - MOV – Apple Movie format
 - AVI – Advanced Video Interleaved – Microsoft
 - WMV – Windows Media Video – Microsoft low quality

Lenses

- Phone cameras have at least 2 cameras, one at the back and one facing the user for video calls. The one at the back is usually higher resolution.
- Newer phones have multiple lenses (and sometimes cameras) these are usually for the following purposes;
 - Optical Zoom
 - Wide angle
 - Low light

Holding the phone, framing, zooming and rule of thirds



- Whenever possible use landscape rather than portrait as this looks better when on a TV or PC screen, and ALWAYS use landscape for videos
- In low light hold the phone in 2 hands and lean against a wall if possible to reduce possibility of shake
- Don't go too mad with getting the exact framing correct, so long as you have everything you need in the picture, its easy to crop it later (even on the camera)
- If you phone does not have optical zoom, don't bother zooming when taking the picture, simply crop it later on. This is because when you zoom on the phone, all it does is crop and magnify the image, thus magnifying any faults, once you've taken the shot, you may not have another go, whereas if you crop it later, its easier to get it right.
- Use the rule of thirds, some phones have an option to display the grid lines
- Pan with the motion for moving objects



On phone adjustments

- Phones have a number of options when you take the picture, here is a list of some of the common ones;
 - Brightness adjust
 - Flash
 - High Dynamic Range
 - Resolution
 - Raw Vs compressed
 - Motion photos
 - Timer
 - Aspect ratio
 - Panoramic
- How to use these varies greatly from phone to phone

On phone editing

- Phones have a limited number of editing features, here list of some of the common ones;
 - Crop and rotate
 - Brightness
 - Contrast
 - saturation
- How to use these varies greatly from phone to phone
- If these don't do what you want then there is always Gimp on your laptop

Exporting Photos from the phone

Moving photos to your disk drive from a USB stick or SD card adaptor

Drag and drop in Explorer



Moving photos to your disk drive from an iPhone

- From an iPhone with a cable
 1. Connect PC to Phone by a USB cable, unlock the phone and select 'Trust the computer' if it asks then either
 - The Phone will appear as a disk drive in Windows explorer and you can copy and paste in the normal way or
 - Use the Windows Photos Application
- From an iPhone wirelessly
 - To copy to a Mac or iPhone use Airdrop if the devices are near each other
 - Use iCloud
 - Email the photo as an attachment to yourself

Moving photos to your disk drive from an Android Phone

- From an Android Phone with a cable
 - Connect PC to Phone by a USB cable, and under ‘Use USB connection for’, select the option called File Transfer or MTP (Media Transfer Protocol), not just charging.
 - The Phone will appear as a disk drive in Windows explorer and you can copy and paste in the normal way or
 - Use the Windows Photos Application
- From an Android phone wirelessly
 - Android Nearby Share will copy to another Android phone
 - Use a cloud storage app like Google Drive
 - Email the photo as an attachment to yourself