




Knowing the difference

**RAW vs JPEG**



You don't have to be involved with photography for very long before the word, '**RAW**', will begin to pop-up time and again.

Whenever you get into conversation with a group of photographers, there is always at least one who will state, "**I ONLY ever shoot raw.**"

Yet, the camera manufacturers continue to provide the **JPEG** option.

Most recent cameras will allow you to shoot **RAW**, **JPEG**, or **BOTH** at the same time.

I ONLY ever  
shoot RAW

Obviously, there are different reasons why you might choose either of these options, and this presentation aims to cover the advantages, and disadvantages, of each choice.



**RAW**



**JPEG**

# What is the primary advantage of a RAW file?

- RAW gives you far greater control over your image in **post-production** while maintaining the integrity of the original file.



# What is the primary advantage of a JPEG file?

- JPEG gives you a quick, easy to use file, which takes up less space in storage, and is compatible for use everywhere.



**JPEG**

In order to help to define these formats, I'd like you to imagine the good old days of film:

Before digital photography took over.

Back to when changing the Exposed Film into a proper Photograph took days.

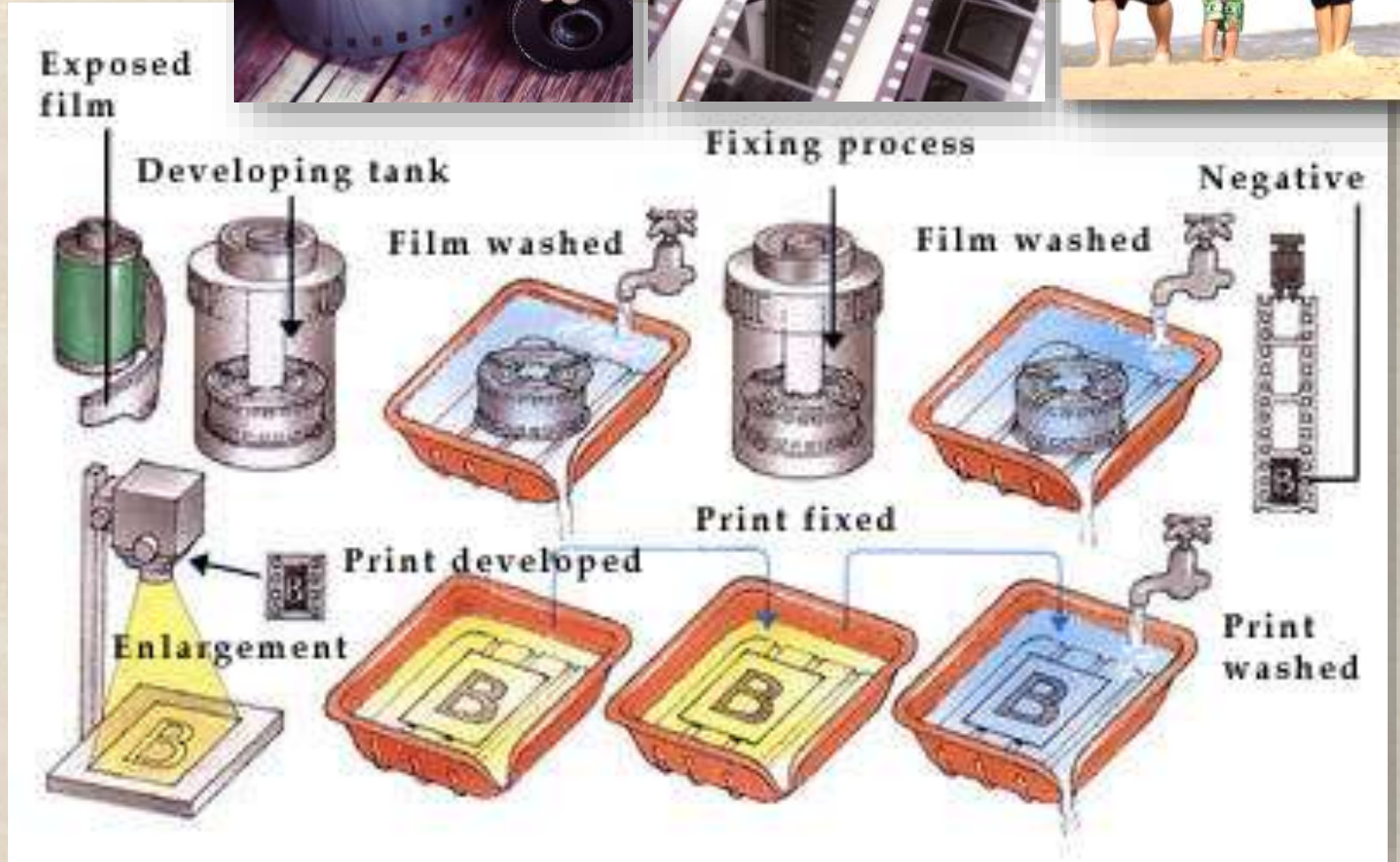




- ❑ We had a camera and an Unexposed roll of film, which was fitted into the camera, before we went out into the world, taking happy holiday photos, with the wild hope that what was shot was worth the effort.
- ❑ The Exposed Film was then carefully taken out of the camera and placed in a sealed box, making sure that no light touched the film.

When we got home, we would take the film to a chemist, where it was magically transformed :

1. The Exposed Film was taken to a Dark Room and went through some nasty chemicals which were used to “fix” it to create a Film Negative.
2. The finished Film Negative was then projected and enlarged onto special photographic paper, developed, fixed and finally washed, all in order to create a Positive Image or Photograph.
3. The whole process would have taken hours, if not days to complete.



It was at the projection stage that the Film Negative could be used to create a proper photograph, which didn't always look like the original scene as viewed in the camera.





Another outcome from the mighty film days was the Photo Slide, which, although it went through approximately the same development process, didn't end up as a Film Negative but as a viewable transparent Photo Slide.

The joy of viewing a Photo Slide required a large projector to send light through the slide onto a large screen, or through a small hand held viewer.



Today, in comparison to  
the good old film days:

The Film Negative would equate  
to a digital RAW file.



The Photo Slide would equate to  
a digital JPEG file.



Let's put this information into context with the RAW Digital File Format.



## Let's put this information into context with the RAW Digital File Format.

- When the film image was processed in the darkroom the original Film Negative was not changed.
- Which is exactly how the RAW (Digital Negative) format works.
- When a RAW file is post processed the original file is not affected, any changes made are stored in a data file called an .XML file.
- To save changes, the image is Exported, and the data in the .XML file is applied to the original to create a new file format such as a JPEG, TIFF or PSD file.



# What does the word Raw actually mean?

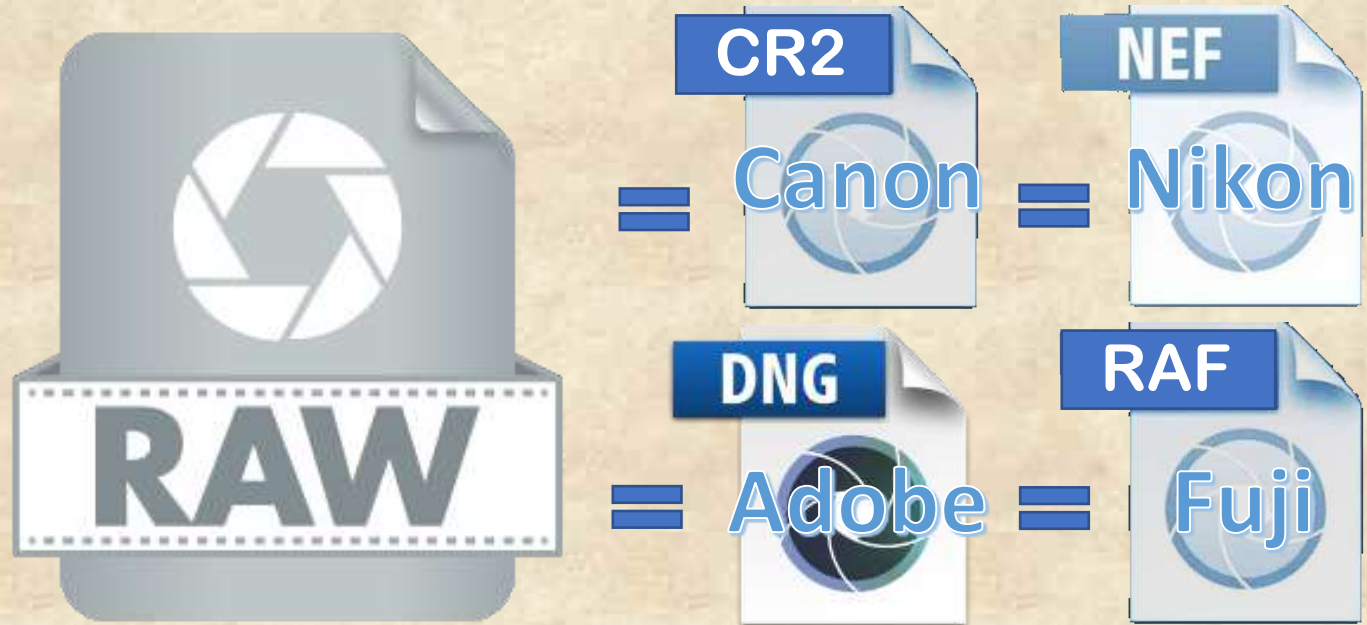
- Nobody seems to know exactly where the term Raw came from.
- In 2004, Adobe developed the .DNG file format, which is a generic file name for a Digital Negative,
- At some point, someone made up the term “Raw”, likening it to being the same as having the ingredients for making a cake, not the actual cake.
- You will find that the terms “Raw” and “.DNG” are often bandied about interchangeably.
- But don’t let that confuse you, just remember

... Digital Negative ...



# How is it defined?

- Another thing is that manufacturers all have their own way of defining a raw file and won't have a .RAW file format! For example, one of Canon's raw file formats is a .CR2 (Canon Raw 2).
- Don't be confused by the term 'raw' and your camera's particular 'raw' file format.
- I once had a Fuji camera that allowed me to choose, raw, jpeg, or raw + jpeg in the camera settings.
- But the file produced, when I choose the raw setting, was an .RAF file.





## The RAW format

- We now know that a RAW format is a Digital Negative.
- RAW file data is exactly that which is captured on the camera's sensor.
- All changes are made in post-production, NOT in the camera.
  
- There are lots of reasons why you would want to shoot raw.
- But there are also reasons why you might NOT want to!
  
- Let's look at the advantages and disadvantages of using RAW format

## Advantages of RAW Format

1. Far more shades of colour.
2. Wider dynamic range and colour gamut.
3. RAW files are far greater than 8 bit. *(more on this later)*
4. Finer control and adjustment potential.
5. Can adjust colour space after image capture.
6. RAW images are lossless.
7. Better sharpening potential.
8. Can be used to convert to other RAW formats.
9. Proof of ownership and authenticity.

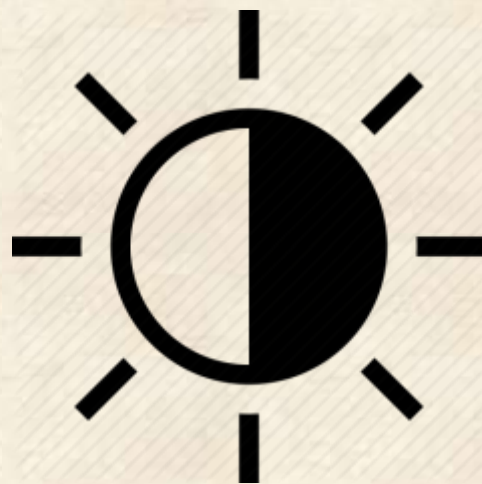
## Disadvantages of RAW format

1. Must be post-processed using special software.
2. RAW format compatibility.
3. Sharing issues.
4. Much larger file sizes.
5. Requires more storage.
6. More files to manage.
7. Longer backups.



Now let us  
look at the  
JPEG File  
Format





JPEG is the default file setting on all new digital cameras, and there are certain advantages for keeping this setting.

JPEG files lock in the camera's image-quality settings:

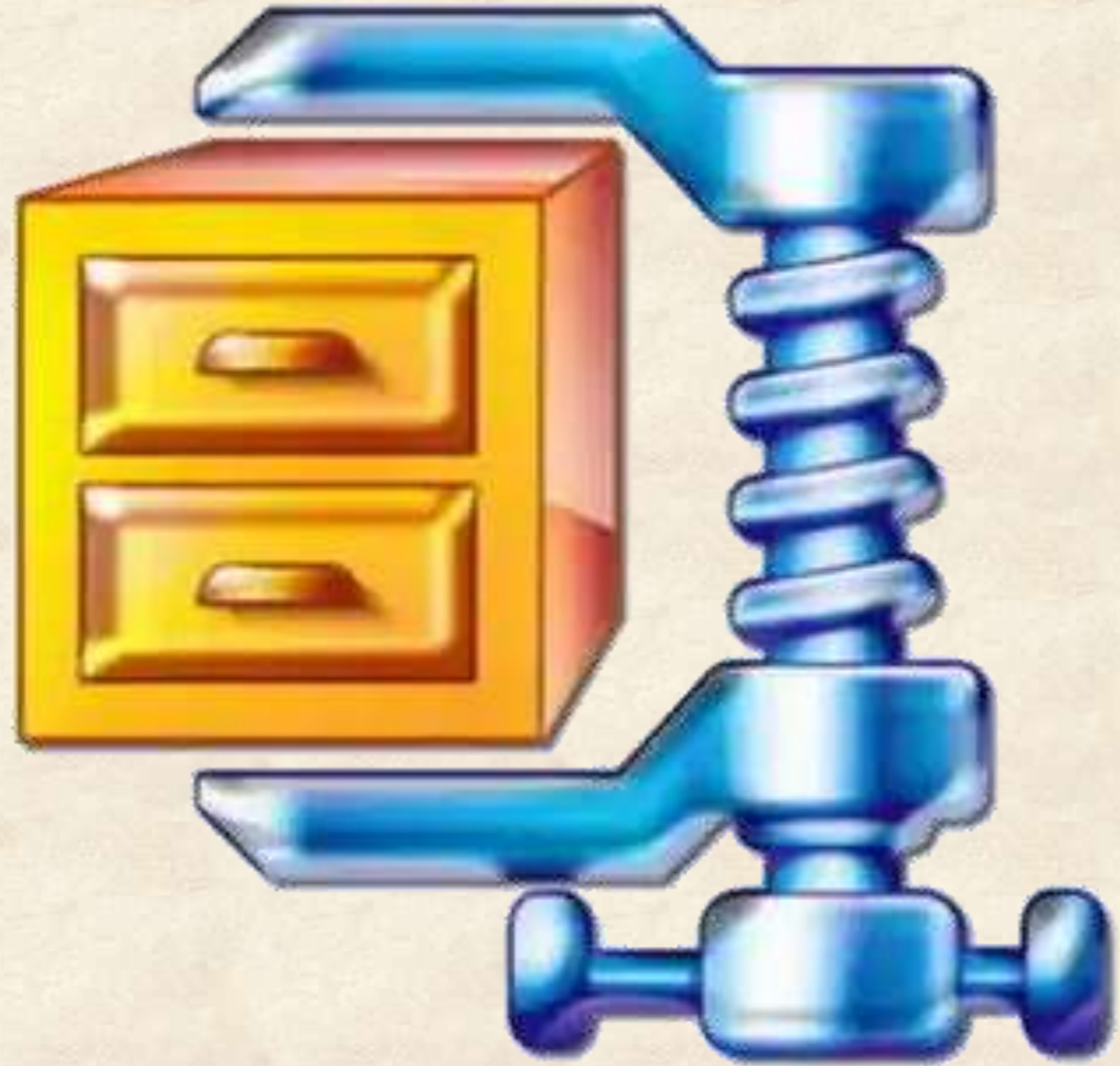
- white balance
- exposure
- sharpening
- and contrast

Image data is also compressed so that more images can be stored on the memory card.



The level of JPEG compression may be adjusted on the camera, having more than one setting.

- **Normal JPEG**  
which may take about one-tenth to one-twentieth the space of an uncompressed file, but with noticeable compression artifacts and loss of quality.
- **Fine JPEG**  
takes up about one-third to one-fifth as much space as an uncompressed image, with little discernible loss in resolution or detail.
- Some cameras have a **Super Fine JPEG** with even less loss of data, but much larger files.
- *By way of reference, a Raw file would be created as an uncompressed image, with no loss of data.*



Early on, we touched on  
Photo Slides, which  
were created from film

...





With a Photo Slide, whatever came out of the camera is what you were stuck with.

And a JPEG image is very similar in that it comes out of the camera as a 'finished' image.



**JPEG**



However, there is a difference between a JPEG image and Photo Slide in that YOU CAN edit the jpeg image... BUT ...

- all edits create a loss in image quality;
- and when you save the changes to the jpeg file; they are permanent;
- and every time you open and close a jpeg file there is some minor loss of image quality due to the compression scheme.



With everything that 'raw' has going for it, why would you want to shoot .JPEG?

The jpeg picture format has been around the longest, and is acceptable nearly everywhere.

Shooting jpeg puts time on your side.

Shooting jpeg allows you to go from camera to print with no intermediary processing.



## Advantages of JPEG format

1. Already processed.
2. Small footprint.
3. Compatibility.
4. No camera slowdown.
5. Choice of compression.
6. Faster backups.

## Disadvantages of JPEG format

1. Far less shades of colour.
2. Narrow dynamic range and colour gamut.
3. Lossless or Lossy compression.
4. JPEG is 8-bit.
5. Limited recovery options.
6. Camera settings impact JPEG images.



Why would you want to use a JPEG file?

Why would you prefer to use a RAW file?

**Does  
Size  
Matter  
?**

### Advantages of JPEG format

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3. Faster backups.

### Disadvantages of JPEG format

1. Far less shades of colour.
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4. JPEG is 8-bit.



### Advantages of RAW Format

1. Far more shades of colour.
2. Wider dynamic range and colour gamut.
3. RAW files are far greater than 8 bit.

### Disadvantages of RAW format

1. Much larger file sizes.
2. Requires more storage.
3. More files to manage.
4. Longer backups.





Name IMG\_6791.CR2  
Kind Canon Camera Raw file  
Size 24.7 MB

### Is File Size That Important

Although these two pictures are the same, the difference in file size between RAW and JPEG is quite dramatic.



Name IMG\_6791.jpg  
Kind JPEG image  
Size 3.6 MB

# Why is there such a huge file size difference?

The main contributing factors to the large RAW files are :

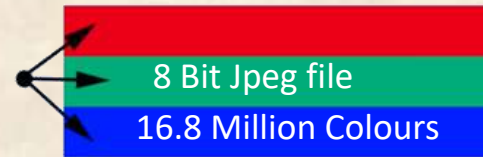
1. Far more shades of colour.
2. Wider dynamic range and colour gamut.
3. More bits !

While a single pixel on an 8-bit JPEG image could hold upto 16.8 million colours, a 12-bit Raw image can contain 68.7 billion colours.

Raw images increase to 4.4 trillion colours at 14-bit Raw.

Some higher-end cameras can even record 16-bit Raw images, giving you 281 TRILLION colours.

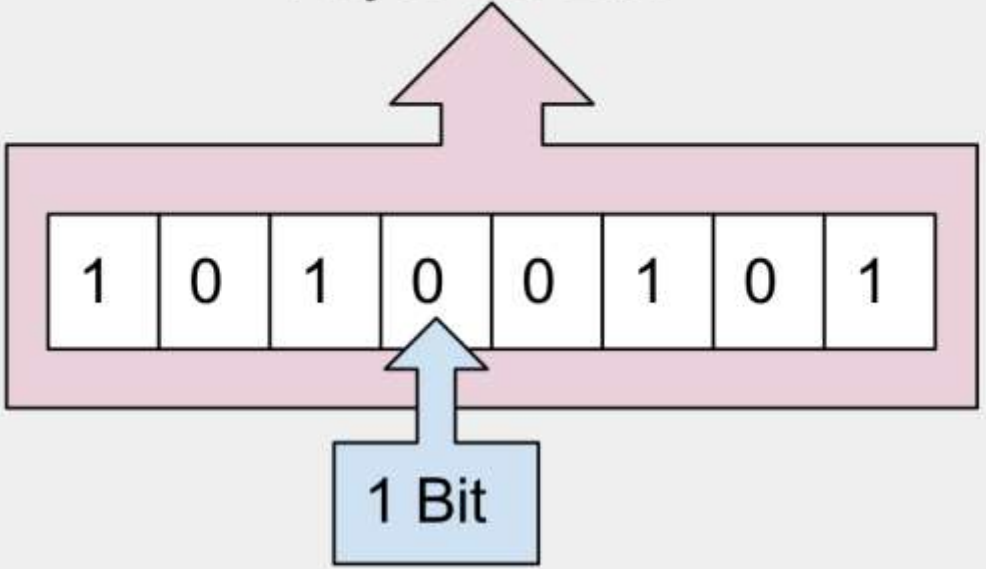
If you do the maths, you're getting upto 16.8 million times more colour with Raw images than with an 8 bit JPEG file, and that's a lot of data to store.



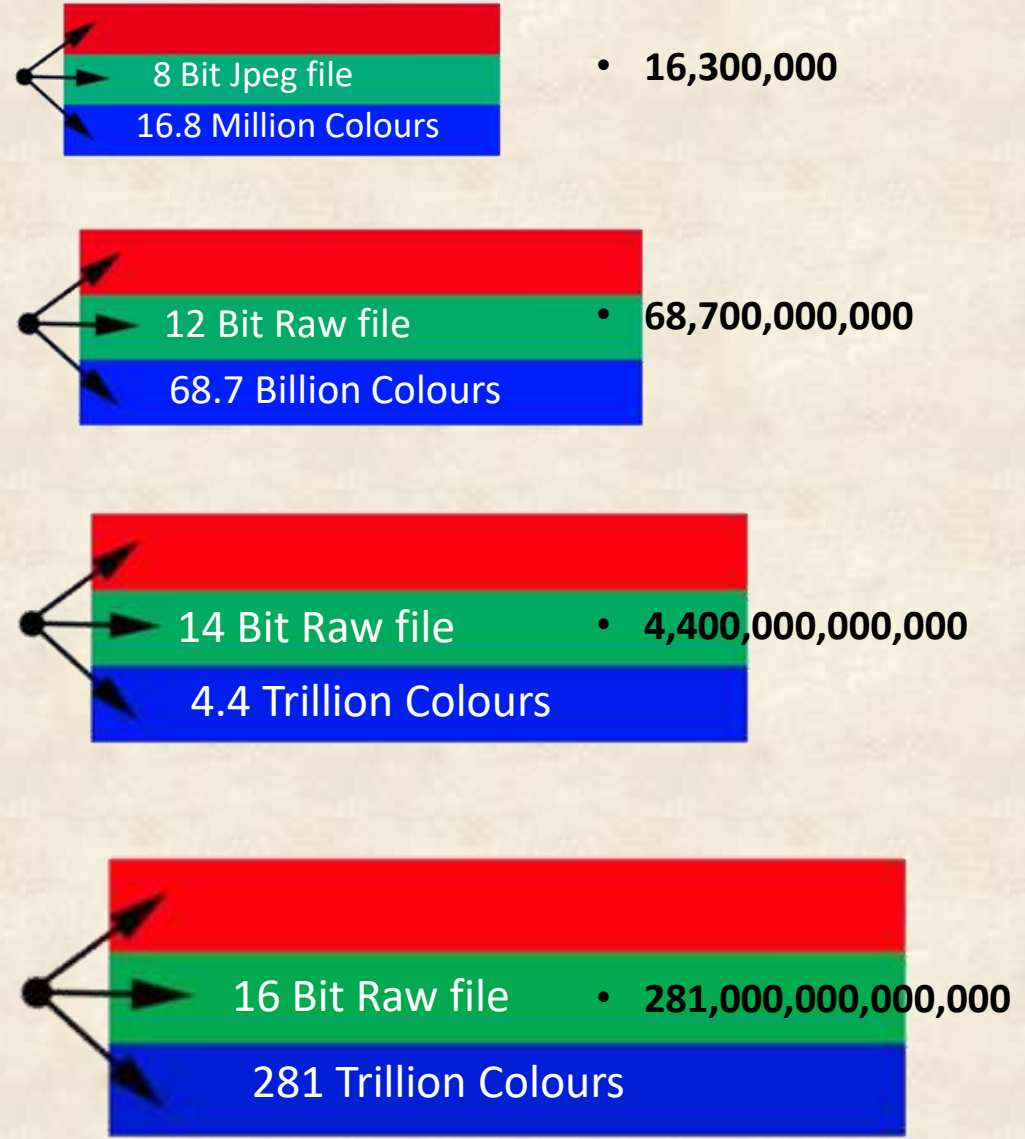
# Units of Storage

The  
1.  
2.  
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1 Byte = 8 Bits



- 1 byte = 8 bits
- 1 kilobyte = 1024 bytes
- 1 megabyte = 1024 kilobyte
- 1 gigabyte = 1024 megabyte
- 1 terabyte = 1024 gigabyte



to  
pages,  
es  
, and

Which is why Raw files need special applications or programs, such as 'Lightroom' and 'Photoshop', to convert them into picture files we can use everywhere.

*Other software is available.*



With all things considered,  
it just comes down to why  
you're taking the photos in  
the first place ?



If you are a Happy Snapper and don't want all the bother of having to post process your pictures.

Select **JPEG**



If shooting a family function or an event where there is a high probability that the photos will never be used, except online, or for a small print.

Select **JPEG**



If shooting for an assignment, or for artwork, or **ANYTHING** that has the possibility of needing the highest possible quality.

Select **RAW**




If on holiday, or a similar activity, and you're not sure whether some photos are destined for Facebook at the end of the day or may be needed to frame a large print later.

Select **BOTH** !



**If in any doubt about  
which format you need.**

**Select BOTH !**



**Well, there you have it,  
you choose!**

*The End*

...IS JUST A NEW  
BEGINNING