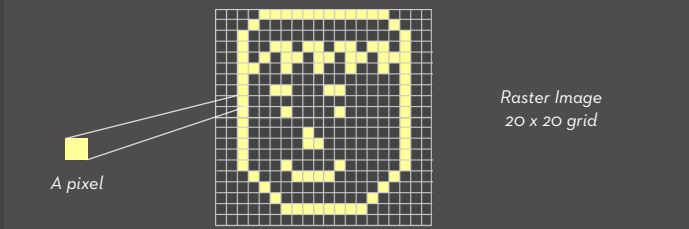


# THE *Yearbook Machine* GUIDE TO IMAGE RESOLUTION

## Part 1: Image Resolution Demystified

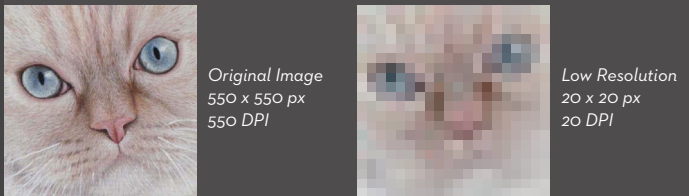
### 1. RASTER IMAGES EXPLAINED: PIXELS AND GRIDS

Most images on computers, including those stored as JPG, BMP, GIF, PNG, and TIFF are known as raster images. Raster is German for 'grid', and raster images are just a grid of small coloured squares called pixels.



The quality of the image is determined by the amount of pixels in the grid - the more pixels you have, the more detail you can store about the image. This measure of how many pixels (px) are in an image is called the *resolution*. So the image above has a resolution of 20 x 20 px.

As you can see above, an image with 20 x 20 px resolution can not contain much detail at all. For instance, if we try to store the photo of a cat below as a 20 x 20 px image it looks very bad and most of the detail is lost.



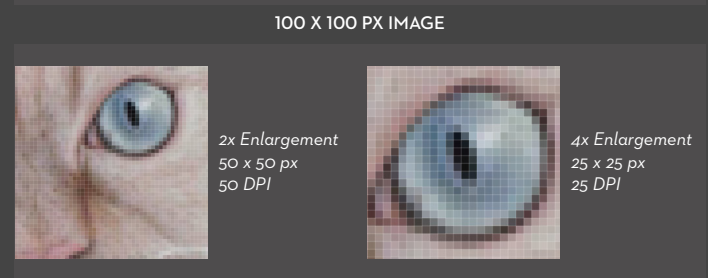
If we store the original image at 40 x 40 px, it looks slightly better, but is still noticeably poor quality. However, at 100 x 100 px, the image does not look quite as poor quality at this size (but is still clearly less sharp than the original).



Yearbook Machine's recommended resolution for images to be printed on a full B5 page is 2894 x 2008 px. So if the 100 x 100 px image above looks reasonable, why do we need it to be more than 20 times that size?

### 2. THE NEED FOR HIGH RESOLUTION IMAGES

The problem with images that look OK when displayed at a certain size is that when enlarged, their poor quality quickly becomes apparent. For instance, the 100 x 100 px image in the previous column starts to look grainy (or 'pixellated') when displayed at twice the size. When displayed at four times the size, the quality is noticeably very poor. By contrast, the original 550 x 550 px image still looks good quality when its size is increased.



This is the reason why an image that may look to be acceptable quality when displayed as a small thumbnail on your computer screen can come to look very poor when printed on paper. Your eyes can't see the difference when the image is small, but when blown up, the image is unattractive and grainy.

This problem is made worse by the fact that printers can normally print many more pixels in a given space than are on a computer screen. You would not normally look at a computer screen from 6 inches away, but you may look at a book this close, so it's necessary for the quality to be higher in print.

**Picture quality in print is measured in Dots Per Inch or DPI:** it's a measure of the amount of pixels that are fit into a given space. Yearbook Machine recommends that you provide images that can be printed at a resolution of **300 dpi**. This is where the figure of 2894 x 2008 px for a full page comes from: our pages are 9.65 x 6.69 inches, which multiplied by 300 makes 2894 x 2008. Images may look acceptable below this level, but to ensure the very best quality in your book, we strongly encourage you to find images in the highest resolution available.

### 3. MORE EXAMPLES

You can see how different levels of DPI will look when printed from the examples already shown on this page: each photo of the cat is 1 inch square, so the pixel width is equal to the DPI. You can see that the cat's eye at 275DPI still looks to be good quality. In many cases, printing photos at 250DPI or 200DPI does look perfectly acceptable. However, higher resolution will look better still, and low resolution will be more noticeable in some images than others. For instance, images with crisp lines or text will start to look fuzzy quite soon below 300DPI.



### 4. WHERE TO GET HIGH RESOLUTION IMAGES FROM?

The good news is that photos from most modern digital cameras, and even many camera phones, are high enough resolution for print. As a guide, any portrait photo above around 6 megapixels should be high enough quality to print on a full page. Photos to be printed on profile pages or as part of articles / montages are often not printed across full pages, so their resolution requirements are often lower.

In general, if you upload all the photos that you want to use in your yearbook direct to the Yearbook Machine website directly from your digital camera, then you will have few problems with image quality in your book. However, many books do still have issues with image resolution, which can either slow down the production of your book (when we ask for better quality images) or lead to your book being less attractive than it could be. So to ensure your book's quality, see **The Yearbook Machine Guide to Image Resolution - Part 2: DOs and DON'Ts!**

# THE *Yearbook Machine* GUIDE TO IMAGE RESOLUTION

## Part 2: DOs and DON'Ts

### DO UPLOAD PHOTOS IN THEIR ORIGINAL SIZE FROM YOUR DIGITAL CAMERA OR SEND THEM TO YEARBOOK MACHINE ON CD/DVD

Where possible, upload photos to Yearbook Machine in their original form from your digital camera. Files may take longer to upload (as they will be larger, higher quality files), but this will give you maximum flexibility to use the images as you want and will make your book the best possible quality.

If you would like to add lots of photos to the Yearbook Machine system, you can send us a CD / DVD for us to upload directly to the system. Call or email for more info.

### DO LOOK AT FILE SIZES

If you have a file and are wondering what its resolution is, you can easily find this by right-clicking on the file on your computer and clicking 'Properties' (Windows) or 'Get Info' (Mac). You can also find out within the Yearbook Machine system. However, without even doing this, you can instantly tell if an image is low-resolution before uploading it by looking at its filesize.

If a file is below a given size, it's impossible for it to be a high-resolution image. For instance, a JPG file that is 100kb or lower will not be high-resolution. Files that are larger than 1mb are likely to be high-resolution, although this is not guaranteed.

The quality of vector images such as EPS, SVG and AI files is not determined by filesize in the same way as for other image types.

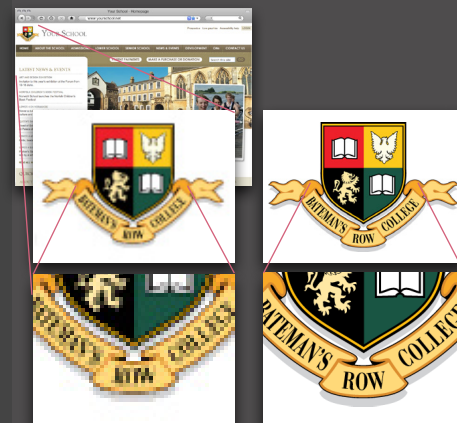
Here are some **rough** rules for file sizes:

File Type	Low Resolution File Size	High Resolution File Size
JPG, PNG, TIFF, GIF, PDF	less than 500kb	at least 1mb
EPS, SVG, AI	Varies	Varies

### DO UPLOAD YOUR SCHOOL'S CREST OR LOGO IN HIGH RESOLUTION OR AS A VECTOR IMAGE

One of the most frequent and biggest problems with image resolution for Yearbook Machine's customers is in finding a high-quality image of their school's logo or crest.

Many customers initially find their school's crest from its website (or from Google Image Search), and provide this image for use in their yearbook. This almost always results in problems, as a logo used on a website is normally only a very small, low-resolution version.



**IMAGE FROM WEBSITE**

*When enlarged, the poor quality of this image is very obvious. Notice the fuzzy, illegible text*

**HIGH-QUALITY IMAGE**

*This image was not taken from a school website or the internet and has crisper text and lines.*

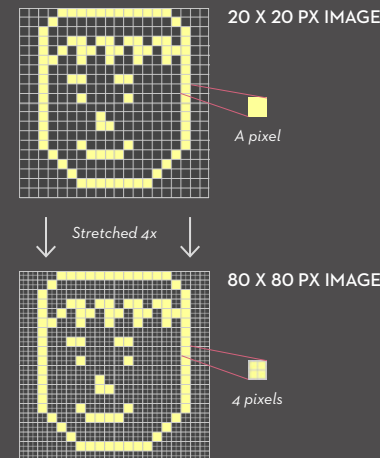
To avoid this problem, you should always get school logos / crests from your school's print department or secretary, and specifically request:

- A very high resolution JPG or TIFF file or
- A vector file.

A vector file is a special type of image that does not use pixels and can be resized to any size without losing quality. Examples of vector file formats are EPS, SVG, AI (Adobe Illustrator) and some PDFs (but converting a low resolution file to PDF will not increase its quality!).

### DON'T STRETCH/RESIZE POOR QUALITY IMAGES TO MAKE THEM APPEAR TO BE HIGHER RESOLUTION THAN THEY ARE

Given a low-resolution image, it's possible to use software such as Adobe Photoshop to artificially increase the resolution by simply stretching each pixel to cover more than one pixel. For example, given the 20 x 20 px image below, if each pixel is split into four identical pixels, the resolution will increase to 80 x 80 px. However, the image is still exactly the same quality as before.



The Yearbook Machine online system automatically checks each image's resolution and gives warnings if it's below the recommended level. It's therefore possible to fool these automated checks by up-scaling images as described above. An example could be to take a photo that has been saved from Facebook and save it as a 2894 x 2008 px image, the size recommended by Yearbook Machine for full-page images. However, this would defeat the object of the image checks, as they are there to make your book look as good as possible!

To avoid problems with image resolution, try to always use original photos taken from digital cameras and to avoid photos that have been resized or taken from the internet, where possible.

### DON'T EXPECT PHOTOS IN SELF-DESIGNED PDF FILES TO BE HIGH QUALITY

We discourage you from making your own PDF files to include in your yearbook, where it is avoidable - they can make your book look inconsistent or poor quality and often produce unexpected results when printed. You should use the Yearbook Machine facilities for Article/Montage page design to make Article/Montage pages. However, if done correctly, self-designed pages that are not articles or montages can add an excellent personalised feel to your book. For more information on this topic, please see '[The Yearbook Machine Guide to Self-Designed Pages](#)'.

If you are making your own PDF pages, you need to be extra careful to ensure that any photos embedded in them are high quality, because they will not be checked automatically by the Yearbook Machine online system in the same way that photos uploaded directly to the system are.

In short, this involves taking the same precautions as for any other photos in your yearbook: not using photos taken from the internet or Facebook across large page areas and using original photos from digital cameras where possible. But, because there are no automatic checks for image quality within PDF or files, you need to take extra care!

### DON'T TRY TO USE PHOTOS FROM FACEBOOK OR OTHER WEBSITES OVER LARGE PAGE AREAS

When you upload photos to websites such as Facebook, their quality and resolution is normally reduced to make the files smaller so that they can upload more quickly. If you then take these photos and print them over a large area in a yearbook (such as across a whole page), the quality will be noticeably poor.

Printing photos from Facebook in small spaces in your yearbook, such as in an additional photo slot on a profile page, should not be a problem. But for larger images, always upload the original file from your digital camera.