The following slide has the same photo at three resolutions. Each version has been resized in Powerpoint to occupy the entire width of the screen.

Remember this doesn’t change the size in terms of the number of pixels which is the true measure of resolution, it just changes the physical size of the photo.

I am assuming a screen or projector size of 800 x 600 pixels.

The image in the top third of the slide is the correct size for this application, it’s 800 pixels wide by 200 pixels high.

The middle third, the number of pixels has been reduced by half in both dimensions, to 400 pixels by 100 pixels.

The bottom third, the number of pixels has been reduced again by half in both dimensions, to 200 pixels by 50 pixels.

The top picture which matches the resolution of the output device exactly gives the best image.

The middle picture is noticeably softer and the bottom one is noticeably awful.

On the screen their resolution in dots per inch is somewhat irrelevant, since that depends on the size of the monitor or projected image. As long as I get the number of pixels right, I’ll have the best image quality available.

If I were to print them, I could describe them as

2.5 x 10 inches at 80 dots per inch
2.5 x 10 inches at 40 dots per inch and
2.5 x 10 inches at 20 dots per inch
Here, I’ve taken the same three pictures and reduced their size in Powerpoint so the width is a quarter of the screen.

The number of pixels in the original image remains the same.

Now the lower image is the correct resolution. It’s 200 pixels wide and a quarter of the screen is 200 pixels wide.

Looking at them in the Slide Show view, the upper two images don’t look any better because the screen can’t do any better. They’re just taking up extra disk space, taking longer to process or print, and transmit on a network.

(Remember this is assuming you’re looking at this on an 800 x 600 monitor or projector. My monitor is 1024 x 768 so the bottom one looks a little fuzzy to me).
For reasons only known in Redmond, Washington, when the 800 pixel wide image is placed on the Powerpoint slide, it’s 111% of the width of the slide. (zoom out in the Slide view) Apparently, Powerpoint doesn’t know how big your monitor is and is assuming it’s 10 inches wide at a resolution of 72 dots per inch.

So if you’ve calculated the exact size of the original image (in pixels) and just plunk it into Powerpoint, you’d have to reduce it to 90% of the original to actually match the resolution of your monitor.

You can do this either just by grabbing a handle and shrinking it, or by using the picture format command under the format menu. This all really describes the ideal situation. In practical terms you have some leeway to adjust the size of a picture in powerpoint and get away with it. If as you work on a slide you need to enlarge or reduce an image, it’s probably OK. Experiment with resizing the images on the previous slide to see how much difference it makes.

However, if you plan ahead and attempt to come close the ideal, you’ll get the best image quality for the least amount of disk space.