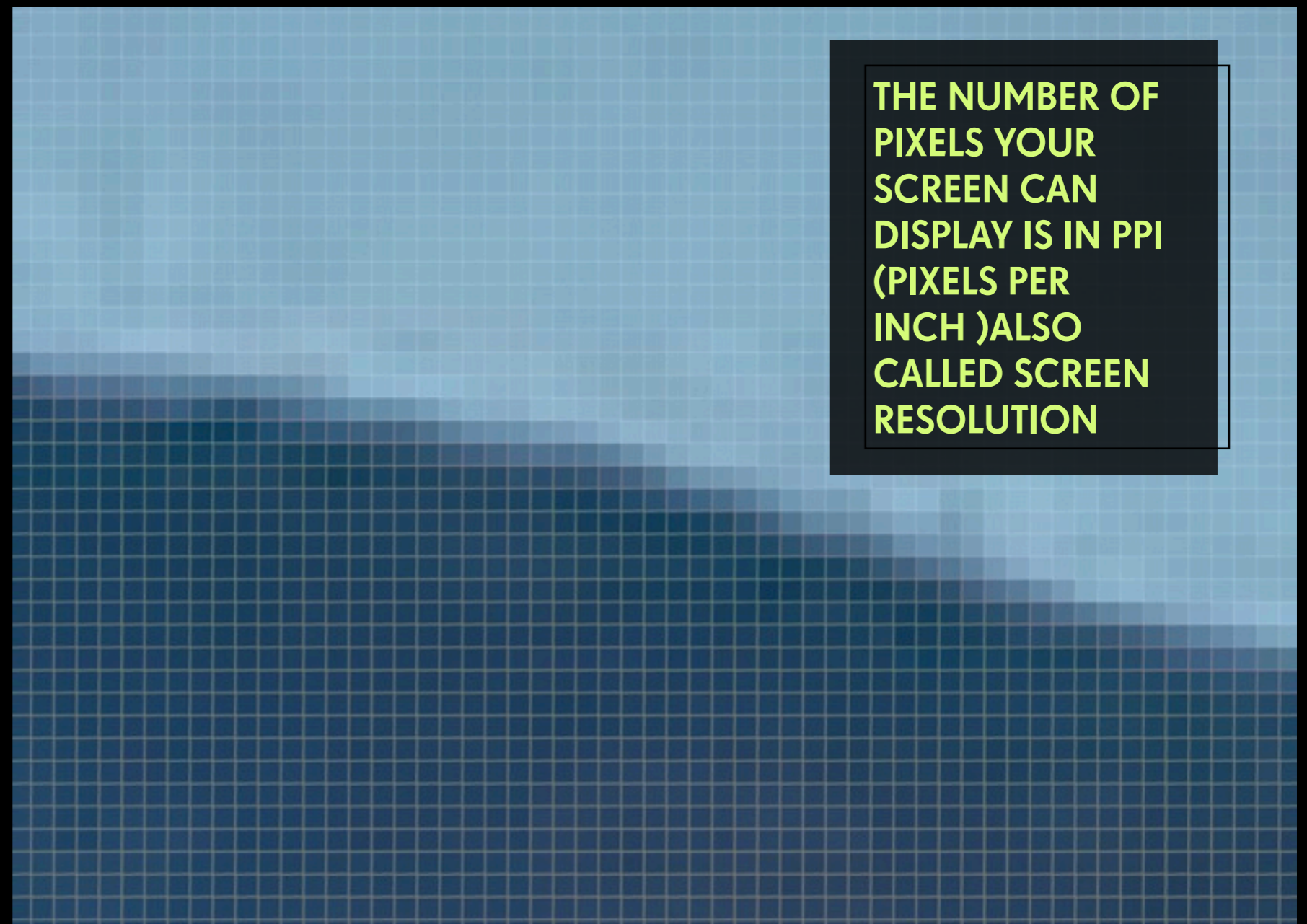


# HOW TO: RESOLUTION AND RESIZING IN PHOTOSHOP

**DIGITAL PHOTOS ARE  
BITMAP IMAGES**

**IN CONTRAST TO  
VECTOR IMAGES**

THEY ARE MADE UP OF **PIXELS IN A GRID** - DISPLAYED BY THE PIXELS OF YOUR MONITOR



THE NUMBER OF PIXELS YOUR SCREEN CAN DISPLAY IS IN PPI (PIXELS PER INCH )ALSO CALLED SCREEN RESOLUTION

# WHAT IS RESOLUTION?

THE AMOUNT OF  
INFORMATION IN YOUR  
IMAGE

IN PRACTICAL TERMS

RESOLUTION =

**THE NUMBER OF DOTS**

**PER INCH IN YOUR**

**IMAGE**

RESOLUTION IS GIVEN IN  
**DPI (DOTS PER INCH)**

RELATED BUT NOT IDENTICAL:

**PPI (PIXELS PER INCH)**. SCREENS  
DISPLAY PIXELS (TINY SQUARES)  
AND PRINTERS PRINT TINY DOTS.

**RESOLUTION  
TRANSLATES INTO  
IMAGE QUALITY AND  
IS CORRELATED WITH  
FILE SIZE**

# **CORRECT RESOLUTION** MAKES FOR A CLEAR, DETAILED IMAGE:





**LOW RESOLUTION** MAKES THINGS LOOK JAGGY OR ALIASED (YOU CAN SEE PIXELS ON THE EDGES).



**LOW RESOLUTION** CAN ALSO MAKE IMAGES LOOK BLURRY/ MUSHY.



# SO I'LL MAKE THE RESOLUTION REALLY BIG?

**NO - VERY HIGH RESOLUTION** ISN'T THE ANSWER. IF YOU HAVE MORE RESOLUTION THAN YOU NEED YOU WASTE DISK SPACE, PROCESSING TIME, AND LOADING TIME (IF IT'S A WEB PICTURE OR POWERPOINT SLIDE FOR INSTANCE). SOMETIMES IT MIGHT BE TOO BIG TO LOAD AT ALL.

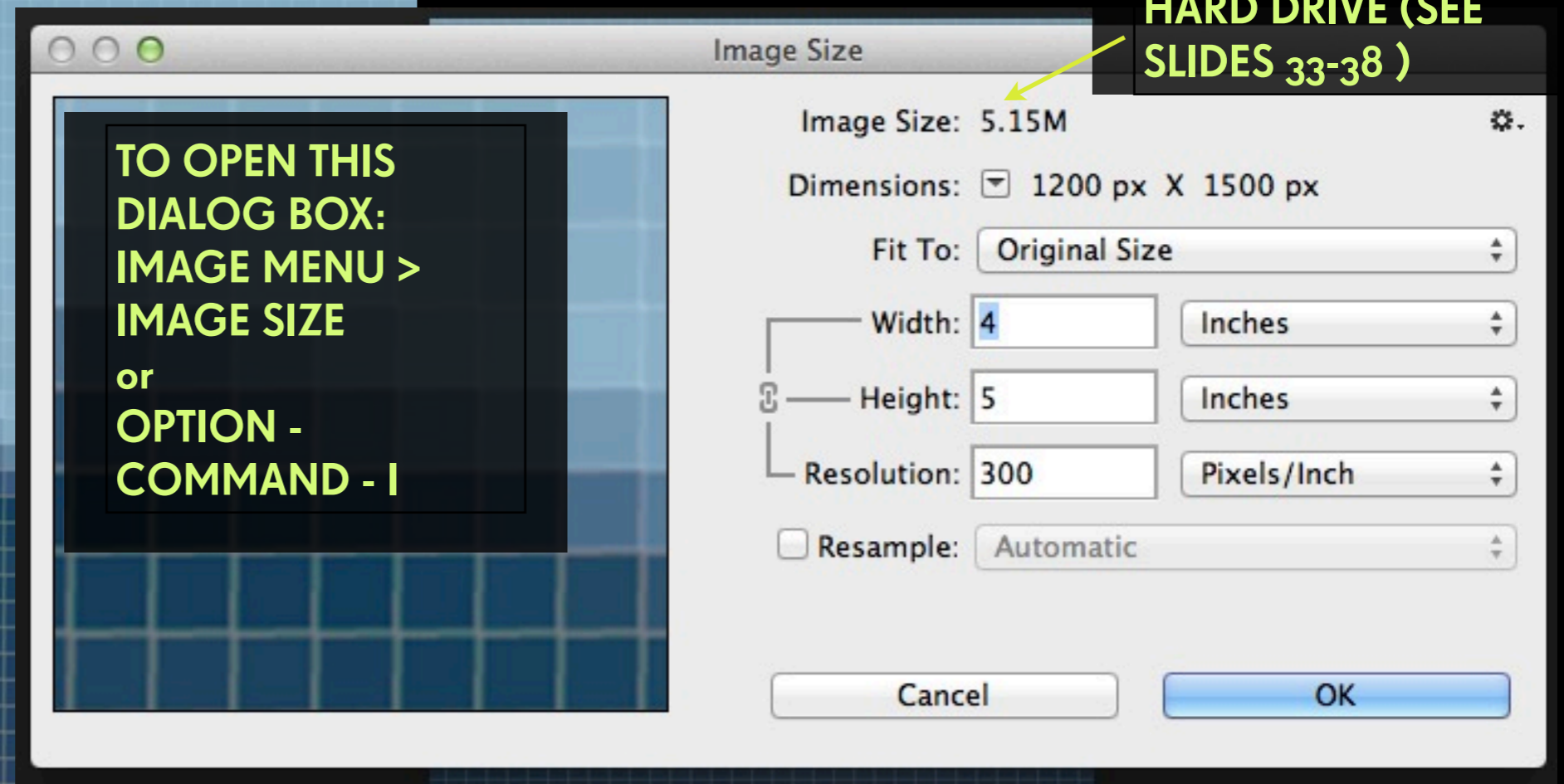
**RESOLUTION IS**  
RELATED TO THE  
**PHYSICAL SIZE OF**  
YOUR IMAGE

**RESOLUTION AND  
SIZE HAVE AN  
INVERSE  
RELATIONSHIP**

WHEN YOU MAKE A  
CHANGE WITHOUT  
RESAMPLING **SIZE GOES  
UP WHEN RESOLUTION  
GOES DOWN**

THIS IMAGE IS **300 DPI** WHEN IT IS  
A PHYSICAL SIZE OF **4" X 5"**

**SORT OF THE SIZE OF  
THE FILE ON YOUR  
HARD DRIVE (SEE  
SLIDES 33-38 )**



**300** TINY SQUARES IN **EACH INCH**  
OF IMAGE



# WHEN CHANGED TO 72 DPI THE PHYSICAL SIZE GETS BIGGER

The image shows a screenshot of a software interface with a grid background. A dialog box titled "Image Size" is open, displaying the following settings:

- Image Size: 5.15M
- Dimensions: 1200 px X 1500 px
- Fit To: Custom
- Width: 16.667 Inches
- Height: 20.833 Inches
- Resolution: 72 Pixels/Inch
- Resample:  Automatic

Annotations include:

- A yellow arrow pointing from the main title to the "Image Size" field, with the text "NOTICE THE SIZE OF THE FILE DATA HASN'T CHANGED".
- A yellow arrow pointing from the main title to the "Resample" checkbox, with the text "MAKE SURE RESAMPLE BOX IS UNCHECKED IF YOU DON'T WANT TO GAIN OR LOSE INFORMATION."



THE SAME NUMBER OF PIXELS ARE  
STRETCHED OUT TO **72 PIXELS PER INCH**  
SO THE IMAGE GAINS SIZE

A large blue grid representing a stretched image. The grid is composed of many small squares, and the overall size of the grid is larger than the text above it, illustrating the concept of stretching pixels.

EACH PIXEL IS BIGGER - SO THE  
IMAGE IS BIGGER

**PROPER RESOLUTION  
DIFFERS DEPENDING ON  
MODE OF DISPLAY:  
PRINT, PROJECTION,  
MOBILE DEVICE, WEB, ETC**

**GENERALLY SPEAKING**, THE FOLLOWING IMAGE RESOLUTIONS ARE STANDARD. (IF YOU ARE ASKED TO SUBMIT IMAGES, THESE ARE GENERALLY THE NUMBERS YOU WILL SEE.)

**PRINT RESOLUTION = 300 DPI**  
**SCREEN RESOLUTION = 72 DPI**

**IF YOU FOLLOW THIS RULE YOU'LL BE FINE.**  
**BUT...**

# MORE DETAILED VERSION PART ONE:

> QUICK-LOADING WEB, STANDARD COMPUTER SCREENS,  
SD PROJECTORS, VIDEO = 72 DPI

> RETINA DISPLAY = 2X STANDARD DISPLAY = 150 DPI

> VIDEO STILL YOU WANT TO ZOOM IN ON = 72 DPI AT THE  
END OF THE ZOOM = EXTRA RESOLUTION DEPENDING ON  
HOW BIG IT WILL BE

> A SMALL SCANNED IMAGE YOU WANT TO SCALE UP =  
EXTRA RESOLUTION DEPENDING ON HOW BIG IT WILL BE

## THESE ARE TIPS WITH RESULTS YOU WILL SEE

# MORE DETAILED VERSION PART TWO:

PROVIDED YOUR ORIGINAL IMAGE HAS ENOUGH RESOLUTION TO DO SO, PRINTED IMAGES MAY LOOK BETTER WHEN PRINTED AT:

> THE NATIVE RESOLUTION OF THE PRINTER.

> A RESOLUTION THAT CAN DIVIDE EVENLY INTO THE NATIVE RESOLUTION OF THE PRINTER OR THE NUMBER OF SPRAY NOZZLES ON THE PRINT HEAD.

**WHAT?? FOR EPSONS = 360 DPI OR 180 DPI**

IMAGES PRINTED AT 180 DPI CAN LOOK BETTER THAN ONES PRINTED AT 250 DPI? YES!

**THESE ARE TIPS WITH RESULTS YOU WILL SEE IF**

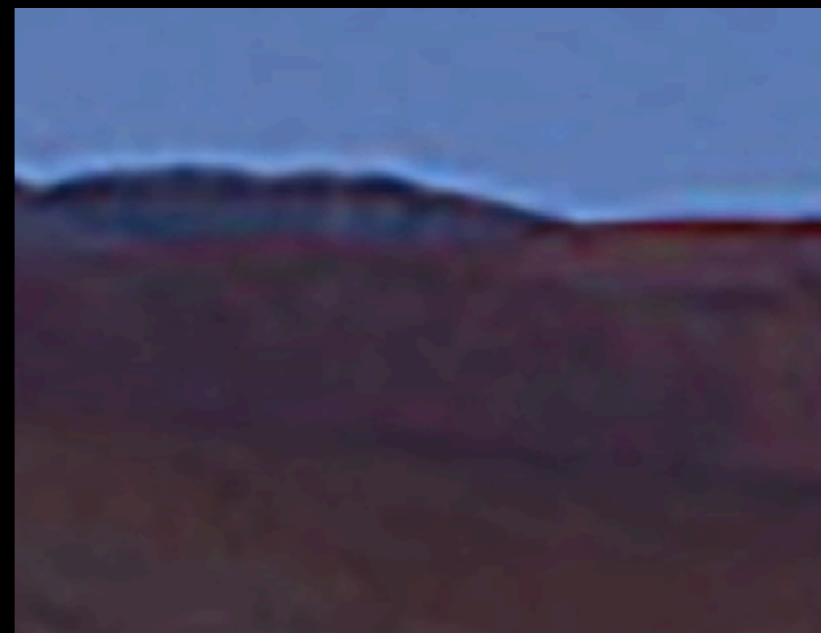
YOU ARE PICKY, YOUR PAPER AND COLOR PROFILES ARE ERROR FREE, AND YOUR IMAGE IS GOOD QUALITY (NO UPRES-ING IN PS)

# IF YOU ARE PREPARING A PRINT, DON'T BELIEVE WHAT YOU SEE ON THE SCREEN

SCREEN RESOLUTION IS LOWER THAN PRINT, SO THINGS CAN LOOK CLEAN ON THE COMPUTER SCREEN



BUT WHEN YOU PRINT THEM OUT YOU CAN SEE THEY ARE NOISY, BLURRY, OR ALIASED.



**WHY CAN'T I ALWAYS TELL IF MY  
IMAGE HAS PROPER RESOLUTION  
FROM LOOKING AT THE SCREEN?**

**THE SCREEN CAN'T SHOW YOU  
MORE RESOLUTION THAN IT IS  
TECHNICALLY CAPABLE OF  
DISPLAYING.**

# IF I CAN'T SEE IT WHAT DO I DO???

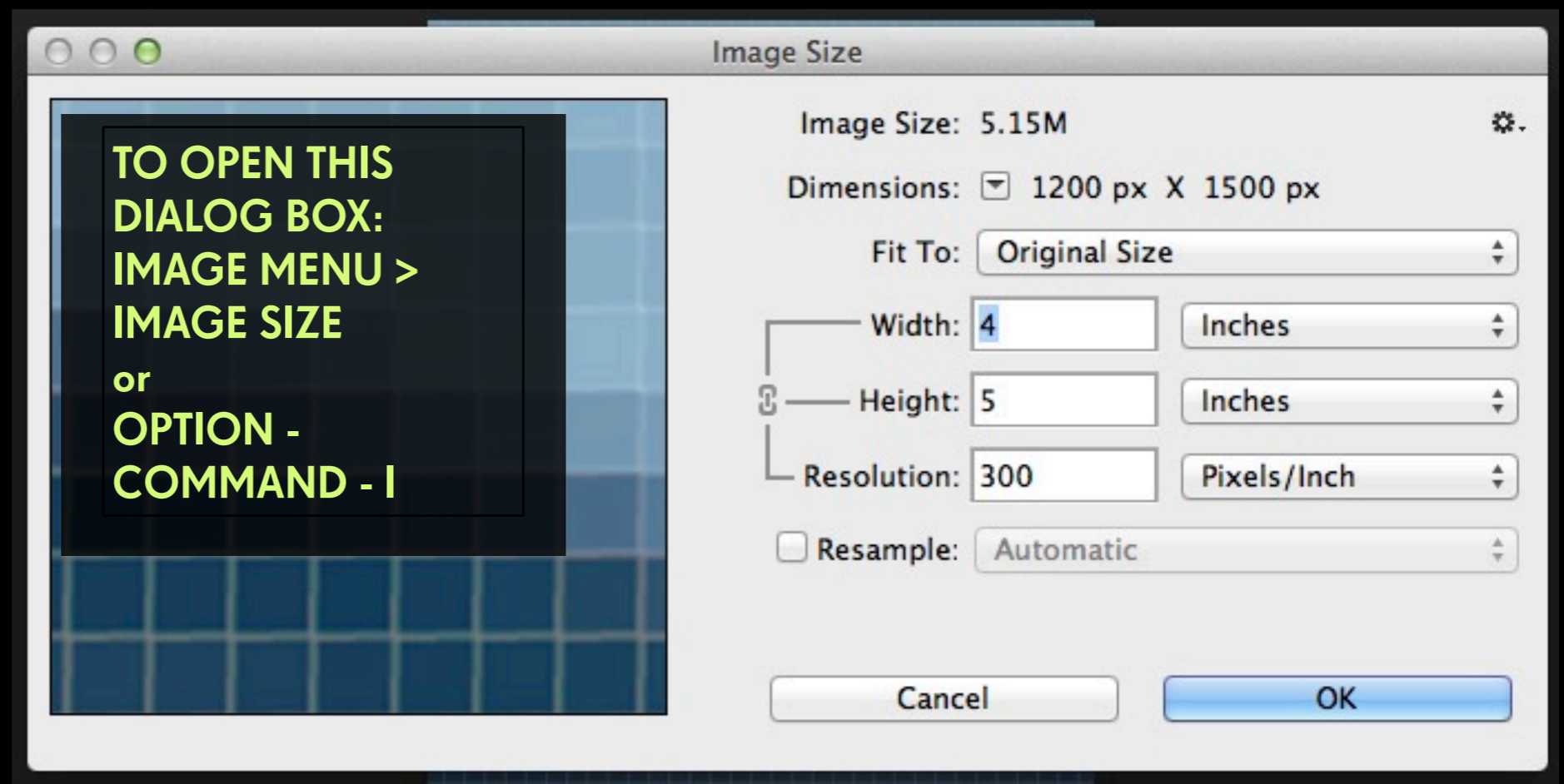
1. GO BY THE NUMBERS
2. PRINT TEST STRIPS



**AND EXPERIENCE THE  
VIRTUALITY!**

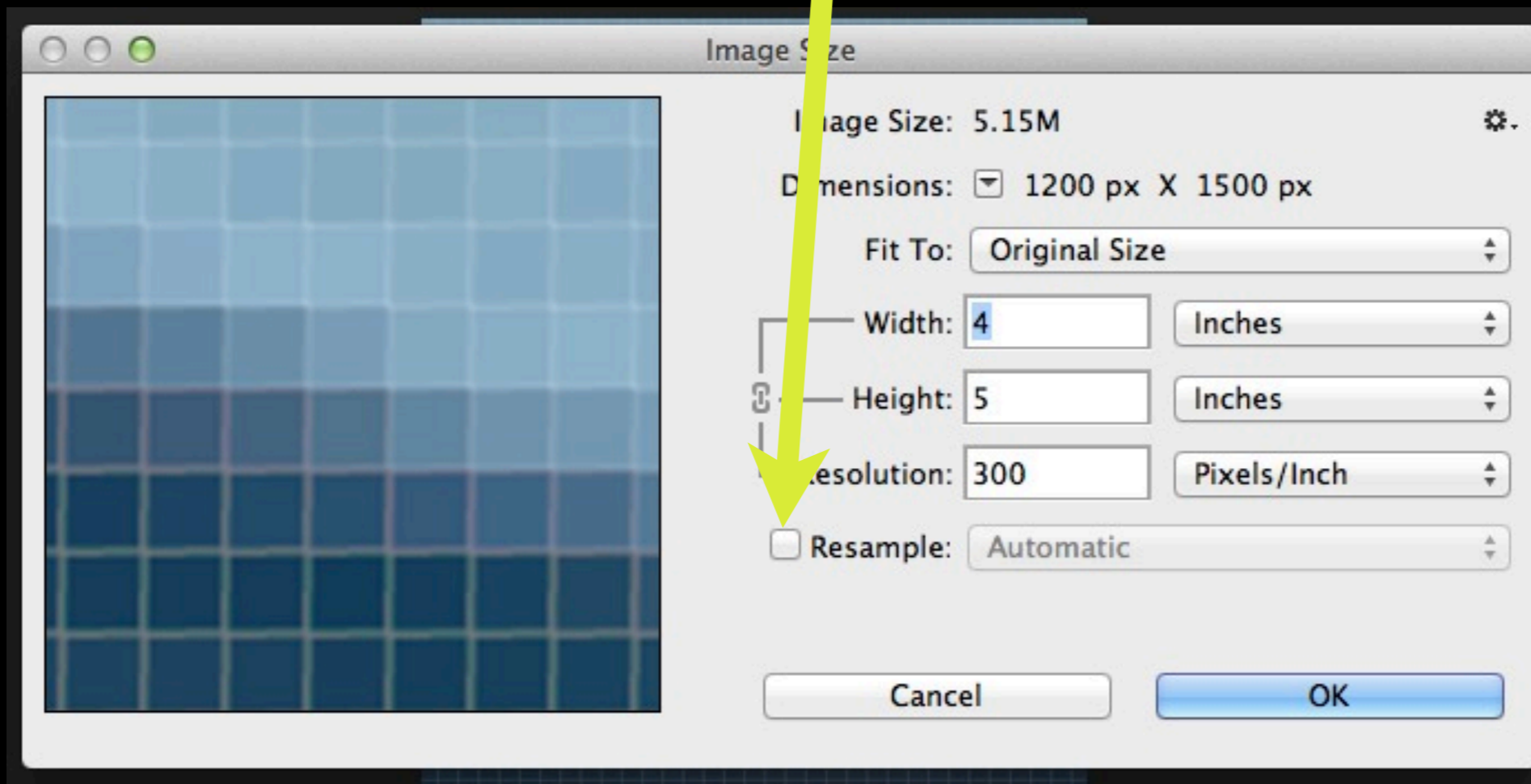
**COLOR DISPLAY IS GOING TO  
HAVE A SIMILAR QUANDARY**

THAT **IMAGE SIZE** DIALOG BOX  
WE JUST LOOKED AT LETS YOU  
**CHANGE THE RESOLUTION AND**  
**THE SIZE TOGETHER OR**  
**SEPARATELY.**

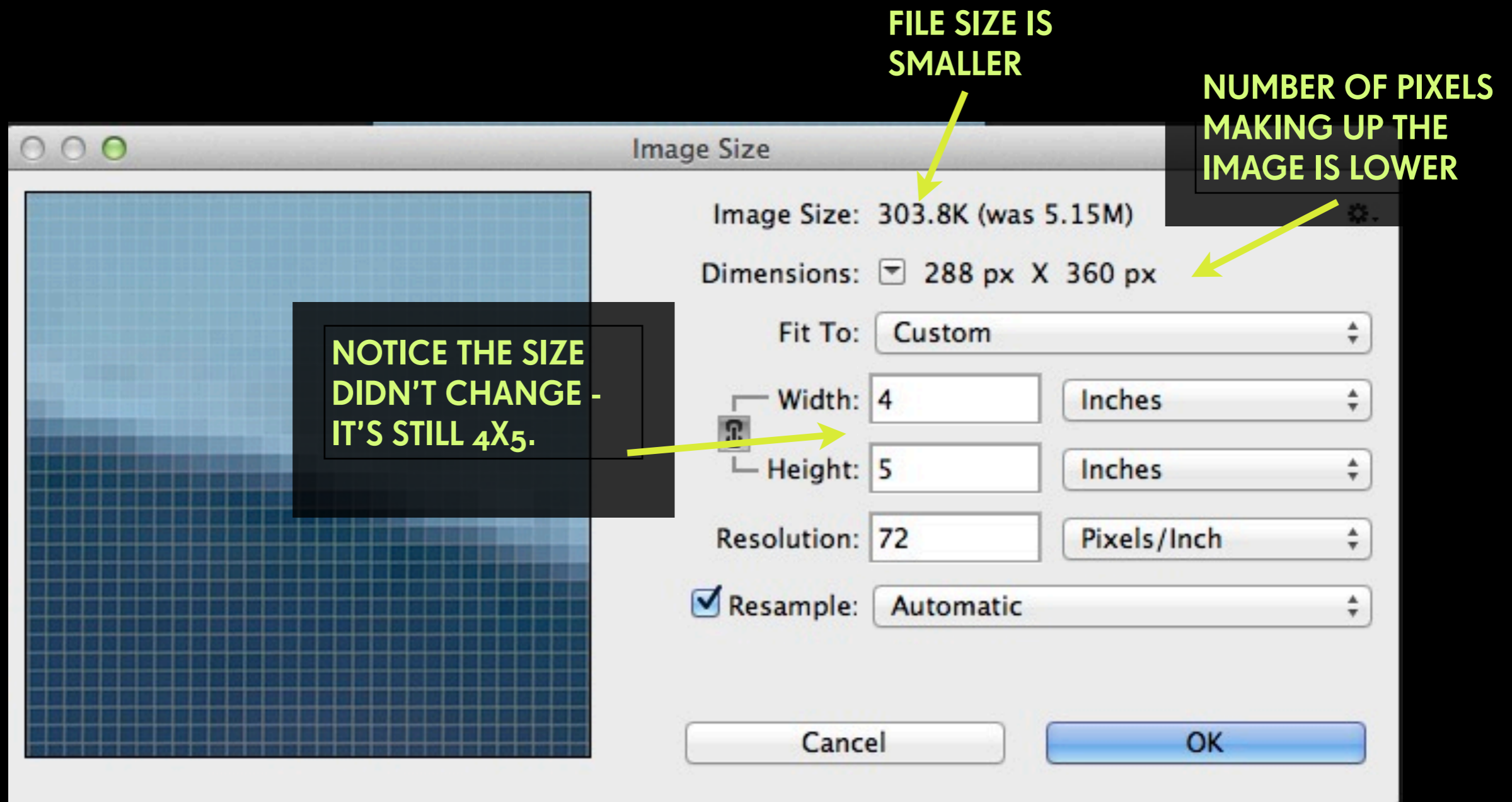




# IN THAT CASE **RESAMPLE**



# HERE RESAMPLE IS SELECTED AND RESOLUTION CHANGED FROM 300 TO 72 DPI



**FILE SIZE IS SMALLER**

**NUMBER OF PIXELS MAKING UP THE IMAGE IS LOWER**

**NOTICE THE SIZE DIDN'T CHANGE - IT'S STILL 4X5.**

Image Size: 303.8K (was 5.15M)

Dimensions: 288 px X 360 px

Fit To: Custom

Width: 4 Inches

Height: 5 Inches

Resolution: 72 Pixels/Inch

Resample: Automatic

Cancel OK

IN OTHER WORDS WE JUST  
**REDUCED THE AMOUNT OF INFO**  
**IN THE IMAGE** AND IT IS **LOWER**  
**QUALITY**

WHEN YOU DOWNSIZE, **SAVE AS**  
**A COPY!** DON'T OVERWRITE A  
HIGHER RES ORIGINAL

IF YOU GO THE OTHER  
WAY (UP-RES) PROCEED  
WITH CAUTION



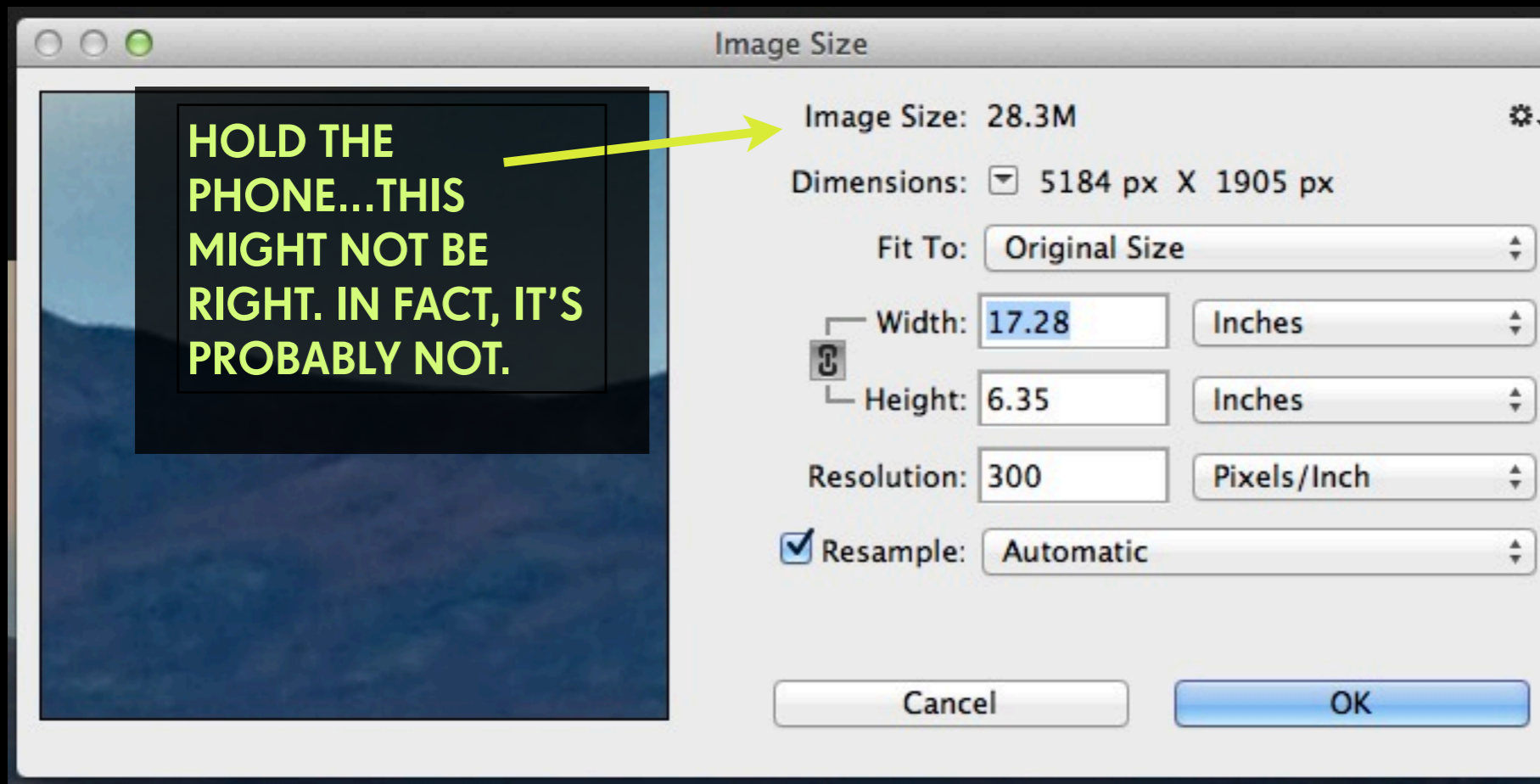
PHOTOSHOP **DOESN'T** DO A  
GREAT JOB OF MANUFACTURING  
(CALLED INTERPOLATING) NEW  
PIXELS TO MAKE YOUR IMAGE  
LARGER, **UP-RES IN SMALL  
INCREMENTS ONLY OR PREPARE  
FOR BLURRY AND/OR JAGGY**



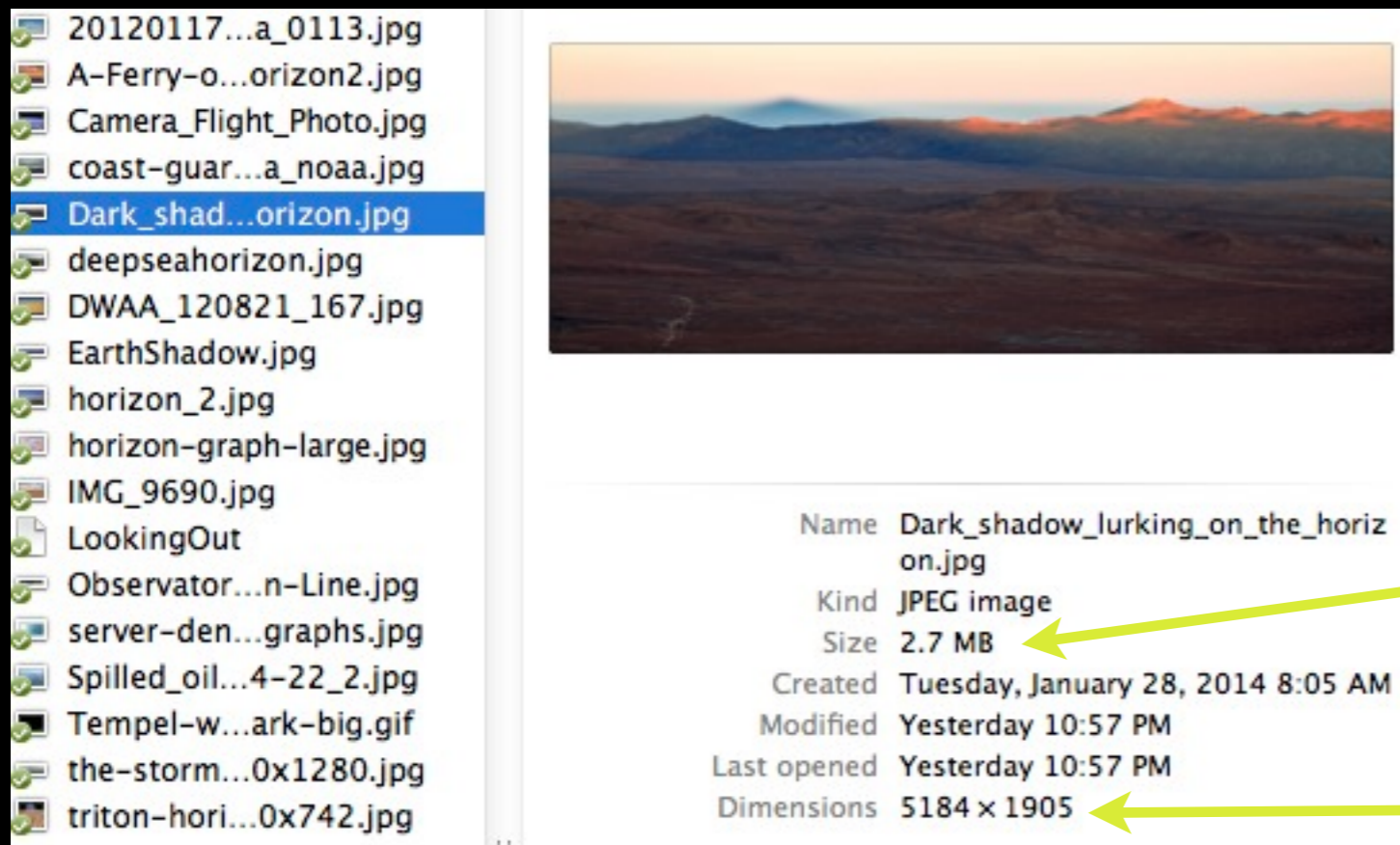
**A NOTE ON FILE SIZE** THERE ARE  
MULTIPLE PLACES YOU CAN LOOK  
TO SEE HOW BIG YOUR FILE IS IN  
TERMS OF DATA

# IN PHOTOSHOP

> IMAGE MENU > IMAGE SIZE



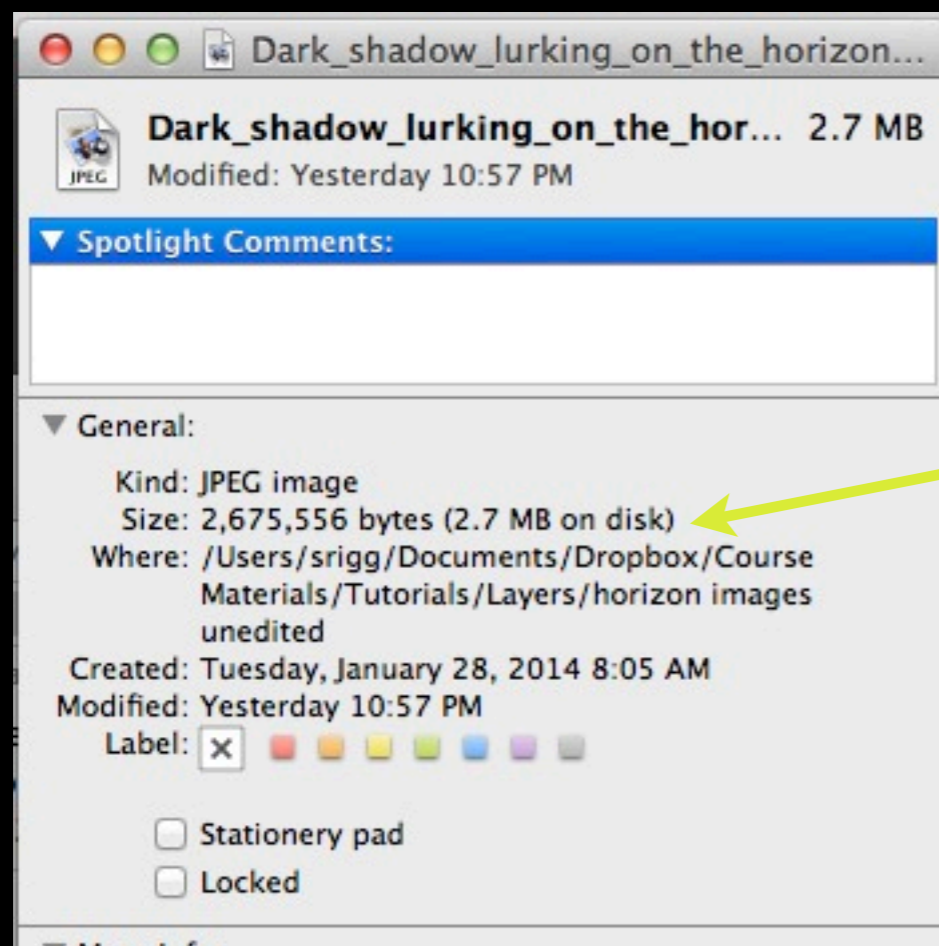
# SAME FILE IN FINDER EASIEST TO SEE WHEN 3 COLUMN VIEW IS ON IN FINDER



**DIFFERENT  
NUMBER!!**

**NUMBER OF PIXELS  
IS THE SAME.**

THE TIEBREAKER...**SAME FILE IN "GET INFO"** SELECT THE FILE IN THE LIST AND HIT **COMMAND-I** (OR RIGHT CLICK AND CHOOSE GET INFO FROM THE CONTEXTUAL MENU)



**THE EXACT NUMBER OF BYTES (MAIN FINDER VIEW JUST ROUNDS IT OFF)**

**WHY? PHOTOSHOP TELLS YOU THE FILE SIZE IF YOU SAVED YOUR FILE AS FLATTENED .PSD THIS IMAGE IS A .JPG - A FILE FORMAT THAT SAVES LESS INFORMATION ABOUT YOUR IMAGE**

**SHOULD I SAVE AS A .PSD? MAYBE.**  
DEFINITELY YES IF YOU ARE  
WORKING ON A HIGH QUALITY  
PRINT. NOT IF YOU ARE GETTING IT  
READY FOR FACEBOOK. **MORE INFO**  
**IN HOWTO\_FILEFORMATS**