When to Use Photoshop vs. Lightroom

The Woodlands Photography Club
Post-Processing SIG
August 20, 2018

Topics

Toning

Sharpening

Noise Reduction

Dodging and Burning

Vignettes

Removing Distractions

Special Effects

Black & White

Lens Corrections

Printing

Lightroom and Camera RAW

- The Lightroom Develop Module and Adobe Camera RAW (ACR) both work with RAW images (maximum information content) and have the same functionality.

- Photoshop converts images to PSD format which embeds LR or ACR changes already made, losing some of the information and editing capabilities of the RAW file; can't go back to undo/modify LR edits

Toning

- LR/ACR: All basic toning is available in a single panel, including the Presence group

  ✦ More advanced total control with tone curves panel

- PS: Most toning effects available as separate adjustment layers

  ✦ Others can be approximated with a combination of adjustment layers and blending modes; CUMBERSOME

  ✦ Advanced tone adjustments available through luminosity masking - requires additional skills and experience; plug-ins available

Sharpening

- LR/ACR Sharpening is competitive with most other tools, including PS
    - ✦ Masking provides effective "high-pass" filter to get rid of sharpening-induced noise ("brains") in smoother areas
- When masking reduces sharpness where you wanted sharpness, switch to PS
    - ✦ Try Filter-Sharpen-Smart Sharpen
    - ✦ Add a layer mask to mask the over-sharpened areas

Noise Reduction

- LR/ACR significantly better than PS

- Color noise is managed with very low slider setting

- Reducing luminance noise can reduce detail where you wanted it

- Consider zeroing out luminance noise slider and use adjustment brush to selectively reduce noise

- Many prefer plug-ins, such as Nik Collection Dfine 2, Topaz DeNoise 6, ON1 Noise Reduction Filter

Dodging and Burning

- Reminder: dodging is lightening, burning is darkening

- LR/ACR: Brush tool has dodging and burning presets, which can be customized; new range masking feature adds more power

- PS: Dodging and burning tools can be adjusted for tonal range & exposure level; switch from dodge to burn using option/alt

- Matt K likes PS, Mac R likes LR

- **The Lightroom adjustment brush is like a multidimensional version of PS Dodge and Burn**

Vignettes

- LR/ACR: Vignette tool is always centered (post crop) and has sliders for roundness, feather, strength
  - ✦ Can make customized vignette with the **radial adjustment tool**
- PS: Based on the elliptical marquis selection tool
  - ✦ Make an elliptical selection, adjust feather, invert selection
  - ✦ Command/control J to create new layer from selection
  - ✦ Change blend mode to multiply, adjust opacity
- Matt K prefers PS for favorite shots
- Mac R prefers LR radial tool for favorite shots

Removing Distractions

- LR/ACR: Spot Removal Tool
  - ✦ Great for sensor spots, small isolated blemishes (blurry birds)
  - ✦ limitation — the "patch" must come from part of the photo; cannot heal over a healed area; extensive "repair" is time consuming and often not effective

- PS: Spot Healing Brush tool, Healing Brush tool, Patch tool, Clone Stamp tool
  - ✦ Tool depends on situation; practice & experience useful
  - ✦ "Content-aware" uses local colors/textures; industry-leading

Special Effects

- LR/ACR: What's a special effect? Aren't I special enough? I think I'm very special.

- PS: Working with more than one image; blending; replacing the sky; adding textures; adding lens flare, star bursts, borders, frames

  ✦ Usually involves multiple LAYERS; choice of BLEND MODES; semi-automated SELECTIONS; LAYER MASKS

  ✦ Opens a world of creative possibilities (heroic music please)

- There are numerous special effects plug-ins (and stand-alone apps) - Nik Collection, ON1 Effects, Topaz Labs ($$$$)

Black & White

- LR/ACR: Black & White Treatment in Basic Panel

  ✦ Fast, for low-priority or simple conversions

  ✦ One-click conversion

  ✦ Color range adjustments to alter relative tonal values

  ✦ Full tonal control using Basic Panel and Tone Curve

  ✦ Presets or custom split toning for tinted monochrome

- PS: B&W or Gradient adjustment layer

  ✦ What can I say? It's just different.

- Many use plug-ins (launched from either LR or PS)

  ✦ Nik Collection Silver Efex; ON1 Effects B&W - Both have a veritable PLETHORA of presets as starting points

Lens Corrections

- Lightroom Lens Corrections Panel. Period. — Apply to every image in your catalog!

Printing

- LR: Print Module is effective & flexible
  - ✦ If you start in Lightroom, you can finish in Lightroom
  - ✦ If you already know what you want, and it's not already a template, Print Module takes some learning
    - ❖ Full control of paper size, resolution, background color, "cell" dimensions and location
    - ❖ Single or multiple images per page
    - ❖ Cells may overlap, but must be aligned with page (not tilted)
  - ✦ Print Module can also "print" to a JPEG file for outside printing
- PS: Print function is basic, single image per print
  - ✦ For more creative results - containing graphic design, wacky rotations, overlays, PIP's - create composite result in PS layers and print the result
  - ✦ But you can also return to LR to actually print

Summary

Topic	LR/ACR	PS
Toning	😃	🙁 or 👹
Sharpening	😃	😃
Noise Reduction	😃	😫
Dodging/Burning	😃	😐
Vignettes	😃	😃
Removing Distractions	🙁	😃
Special Effects	😳*	😃*
Black & White	😐*	😐*
Lens Corrections	😃	😳
Printing	😃	😐 or 👹

*plug-ins available

Introduction to Photo Processing Monitors & Monitor Calibration

THE WOODLANDS CAMERA CLUB

POST PROCESSING SPECIAL INTEREST GROUP

20 AUGUST 2018

BY: VANCE SCHWANTES

Agenda

- Monitor selection
- Monitor calibration
- Q&A throughout

Monitor Selection

Choosing a Monitor

Important Choices

- Color gamut (vibrance)
- Bit depth (# of colors)
- How many screens
- Screen size
- Resolution
- Conveniences:
  - Connectivity
  - Rotation
  - Matte/gloss
  - Hood

Take What You Get

- Pixels per inch
- Panel technology
- Aspect ratio
- Refresh rate
- Response time
- Contrast
- Uniformity

* Discussed in the SIG today
* Discussed in the supplemental materials

Color Gamut

- Color gamut: the entire range of colors available on a particular device such as a monitor or printer

- This horseshoe color shape represents what the eye can see; the triangle is what a device can reproduce

- There might be hundreds of color spaces, but the two most common in photography are Adobe RGB and sRGB. Others include ProPhoto, Adobe Wide-Gamut RGB, CIE, Apple, Color Match, etc.

- sRGB was designed to cover the range of CRT monitors. Adobe RGB was designed to mimic the range of CMYK printers

- The Adobe RGB color space is about 35% larger than sRGB; it is more vibrant, offering cyan-turquoise greens that ARE printable but outside of sRGB

- But sRGB is the most common BY FAR

- Lightroom, Photoshop and most cameras offer both options, but the internet standard, most printers, and print shops are exclusively sRGB

- Common monitors won't show much of the additional Adobe RGB palette, and some will "clip" badly (see next slide)

- You need a "wide gamut" monitor to see all of the Adobe RGB gamut, which approximately doubles the price. This is your first big decision

Adobe RGB (1998)

sRGB (1996)
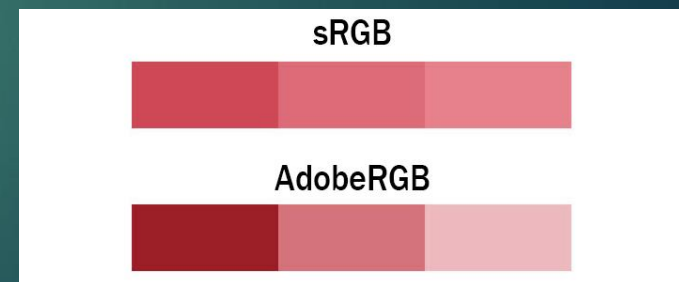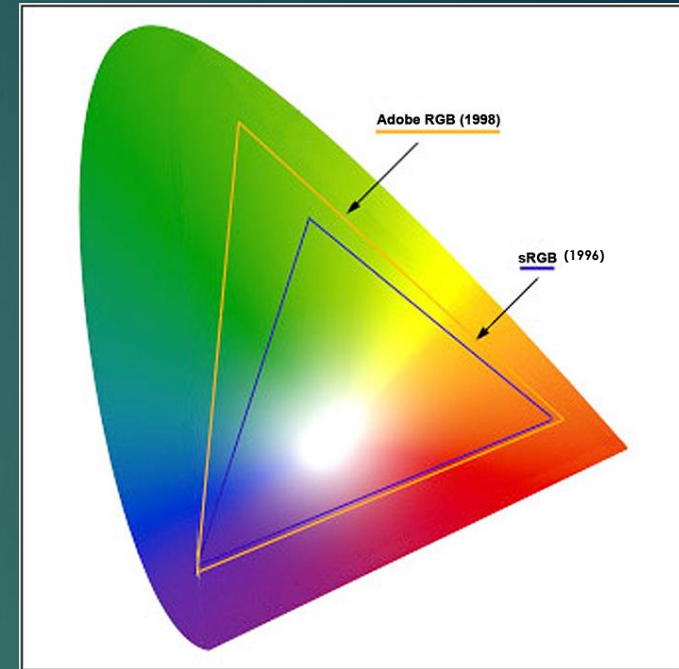
sRGB

AdobeRGB

Color Clipping

(On an inadequate device)

sRGB   AdobeRGB

Do I Need an AdobeRGB Monitor?

YES

- You regularly photograph subjects with vibrant color

- A capable monitor may be the only way you can enjoy these richer Adobe RGB colors

- You print on high quality CMYK printers

- Lightroom will easily convert them to sRGB for export or print

- This means you process in Adobe RGB, and publish in sRGB

- You also use color management techniques

NO

- You can't show Adobe RGB photos on Facebook, or on your TV, and it's difficult to print them

- sRGB is adequate

- sRGB is "safe"

- You don't have, or plan to have an AdobeRGB monitor, so you shoot, process and publish in sRGB

- Many working professionals have given up completely on managing the differences and have gone to sRGB full time to avoid the conflicts

Does my Monitor have a Wide Color Gamut?

BenQ SW271 27" 16:9 4K IPS Monitor
B&H # BESW271 • MFR # SW271

- 27" In-Plane Switching (IPS) Monitor
- USB Type-C / HDMI / DP Inputs
- 3840 x 2160 Resolution
- 1000:1 Contrast Ratio
- 350 cd/m² Brightness
- 178°/178° Viewing Angles
- 5 ms Response Time (GtG)
- 1.07 Billion Colors
- 99% Adobe RGB Color Coverage   ← yes
- Built-In USB Hub
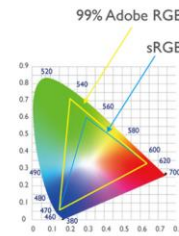
Dell U3818DW 37.5" 21:9 Curved IPS Monitor
B&H # DEU3818DW • MFR # U3818DW

- 37.5" In-Plane Switching (IPS) Panel
- DisplayPort & HDMI Inputs
- 3840 x 1600 Resolution
- 1,000:1 Contrast Ratio
- 350 cd/m² Brightness
- 178°/178° Viewing Angles
- 5 ms Response Time
- Supports up to 1.07 Billion Colors
- Covers 99% of sRGB Color Gamut   ← no
- 2300R Curvature

Color Depth: Bits

- The color gamut triangle is divided into a certain number of colors, according to the number of bits used for each pixel

- More bits = more colors

- More bits does not change the size of the triangle

- More bits does give finer color gradations

- More bits requires a compatible graphics processor and software

- JPEG files are 8 bit, RAW files are 12-14 bit

- The human eye can distinguish 10-12M colors

Bits	Tones per Channel	Total possible tones
6	64	262 thousand
8	256	16.8 million
10	1,024	1.1 billion
12	4,096	68.7 billion

8-bit gradient   8-bit gradient, dithered   24-bit gradient
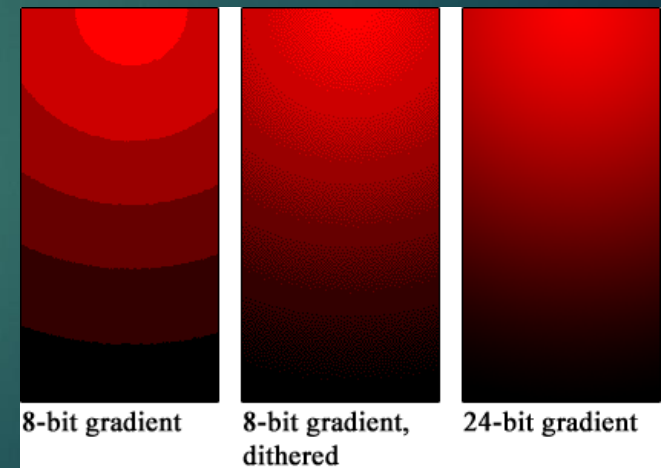
Virtual Bits: FRC

FRC = frame rate control

▶ Virtual colors

▶ An intermediate shade is simulated by cycling rapidly and proportionally between two other shades (temporal dithering)

▶ Implementation may be good or bad

Full-Color Display Using 8-bit Panel   Virtual Full-Color Display Using 6-bit Panel + FRC

https://www.eizo.com/library/basics/maximum_display_colors/
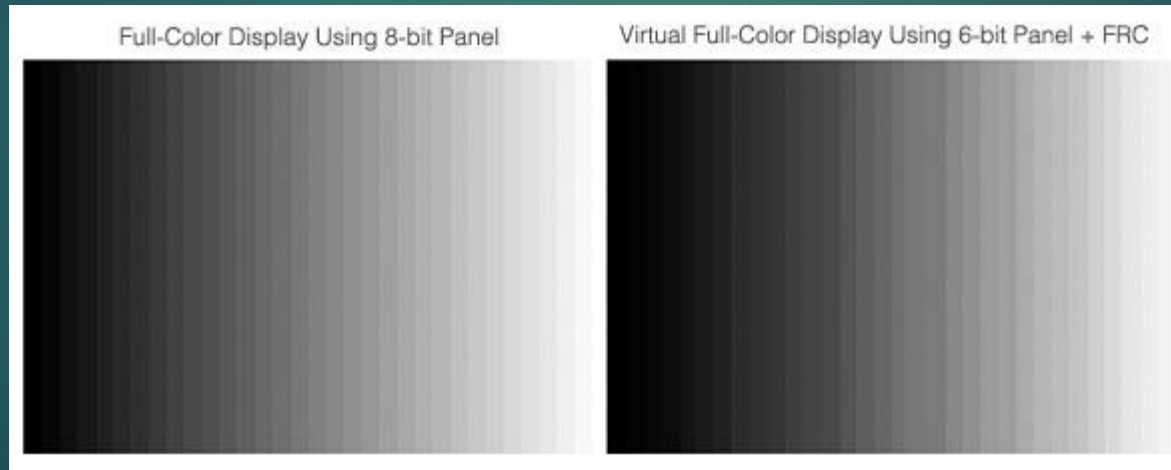
Lookup Table

LUT = lookup table

▶ Hardware in the monitor that stores calibration and color calculations to improve color accuracy and speed

▶ A LUT improves image quality

▶ Having a high bit LUT is good
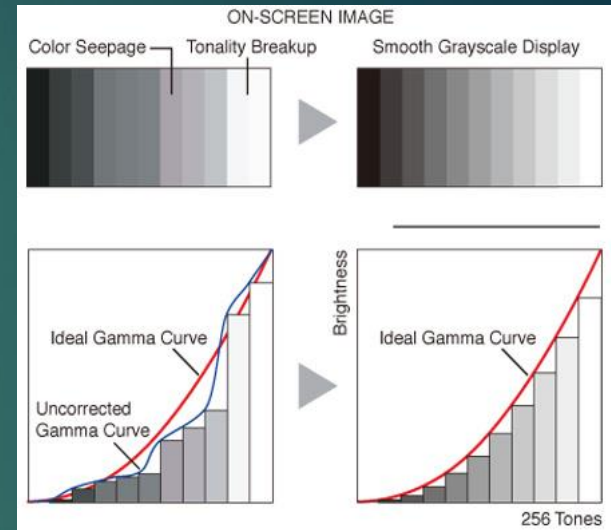
3D LUT

▶ Blends three channel color lookup tables together, instead of three separate independent channels, expanding color accuracy even further

Full discussion here: https://www.eizo.com/library/basics/maximum_display_colors/
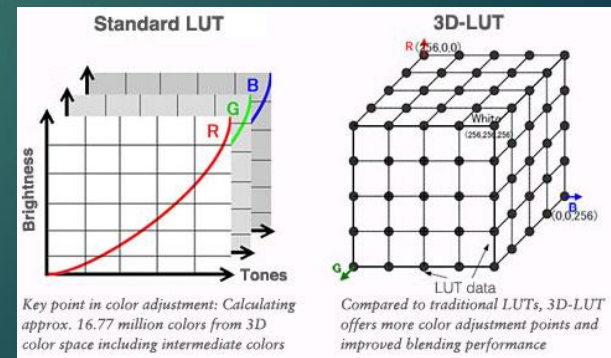
Good, Better, Best

MONITORS:	Oldest, Cheapest	Still Cheap	Average, General Use	Above Average	Photo Editing	Pro Quality
Bits	6 bits	6 bits + FRC	8 bits	8 bits + FRC	10 bits	10 bits + FRC
Lookup Table	-	-	-	10 bit LUT	12 bit 3D LUT	12+ bit 3D LUT
Colors (millions)	0.3	16.7 (virtual)	16.7	1,074 (virtual)	1,074	68,719 (virtual)

Worst ⟶ Best

My Desk

25.5" FHD
~ $200
medium quality
gaming monitor

27" QHD
$600
medium quality
photo editing monitor

Heavy Duty Dual Monitor Stand: $50

Recommended <u>heavy duty</u> inexpensive dual monitor stand:
https://www.amazon.com/gp/product/B0052AWGLE

Resolution

Resolution: the number of pixels on the screen.
Three of the most common sizes are highlighted in blue.
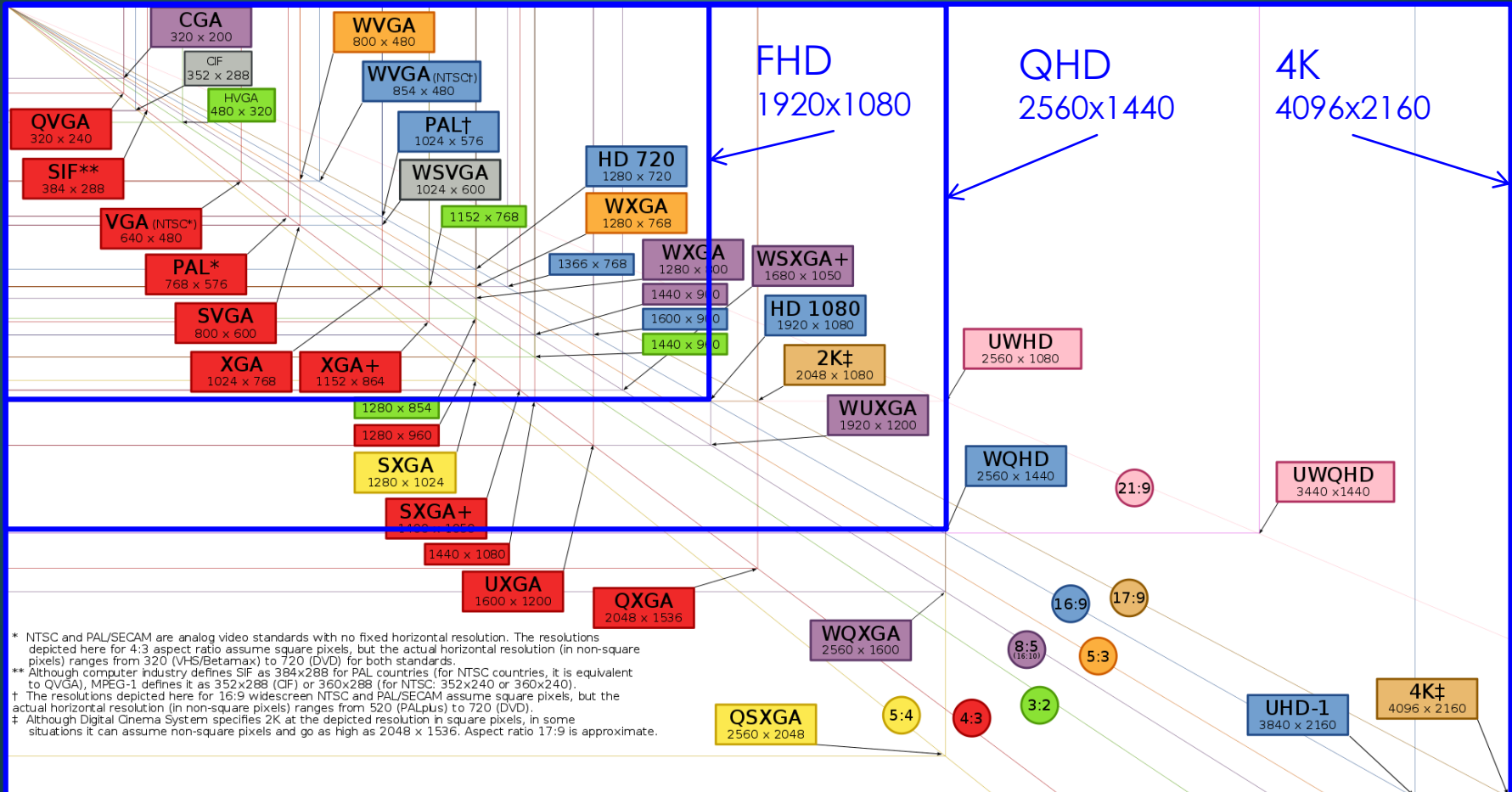
Resolution

Wide format monitors (e.g. 16:9) have overtaken the 4:3 format.
The newer, high megapixel monitors are predominantly wide format.

16:9 and 16:10				4:3		
HD	1280x720	0.9 MP		VGA	640x480	0.3 MP
FHD	1920x1080	2.1 MP		SVGA	800x600	0.5 MP
2K	2048x1080	2.2 MP		XGA	1024x768	0.8 MP
QHD	2560x1440	3.7 MP		SXGA	1280x1024	1.3 MP
UHD	3840x2160	8.3 MP		UXGA	1600x1200	1.9 MP
4K	4096x2160	8.8 MP		QXGA	2048x1536	3.1 MP

Pixel Density

PPI/DPI – pixels or dots per <u>inch</u>

Dot pitch – width of a dot, usually in <u>mm</u>
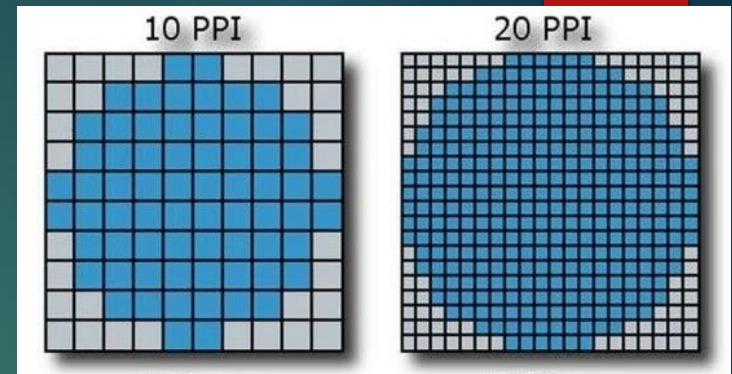
	PPI	Pitch (mm)
Legacy "computer screen resolution"	72	.35
Current average monitor resolution	94	.27
Human eye, average acuity, 2.5 feet[1]	115 (monitor)	.22
2017 27" iMac Retina 5K 5120x2880	218	.12
Human eye, maximum acuity, 2.5 feet	300 (monitor)	.08
Human eye, average acuity, 12 inches	300 (magazines)	.08
iPhone 6 retina HD	326	.08
iPhone X	458	.06
Human eye, maximum acuity, 12 inches[1]	720 (fine art printer)	.04
Sony A7iii 24MP full frame sensor	4,299	<.01

Benchmark

[1] https://wolfcrow.com/blog/notes-by-dr-optoglass-the-resolution-of-the-human-eye/

Monitor Pixel Density

Pixels Per Inch		14"	24"	27"	32"
FHD	1,920 x 1,080	157	92	82	69
QHD	2,560 x 1,440	210	122	109	92
4K	4,096 x 2,160	331	193	172	145

Pink: worse than average human acuity at 2.5'
Green: better than average human acuity at 2.5'

▶ Note that a 14" FHD monitor is sharper than a 32" 4K monitor

▶ Bigger screens invite higher resolution

▶ Farther screens invite lower resolution

▶ Font size is very small on a 4K, requiring scaling with potential scaling-related issues in various applications

▶ "QHD is fine for photo editing, while video editing needs 4K"

Visual acuity: https://www.techspot.com/article/1113-4k-monitor-see-difference/   DPI Calculator   https://www.sven.de/dpi/

Recap: The Big Decisions

Color Gamut (vibrance)
- sRGB   most common
- Adobe RGB   35% larger color space

Screen Size & Quantity
- 24"
- 27"
- 32"

Pixel Density (PPI)
- 94   average
- 109 27" QHD
- 115 avg. eye
- 145 32" 4K
- 157 14" FHD
- 300 max eye

Resolution (pixels)
- FHD   1920x1080   2.1mp
- QHD   2560x1440   3.7mp
- 4K   4096x2160   8.8mp

Bits (colors)
- 8 bits   16.7 million colors
- 8 bits + FRC   1.1 billion virtual colors
- 10 bits   1.1 billion colors, finer tone gradation

Key LCD Panel Criteria

- Color range, richness and accuracy: gamut, bits

- Viewing angle: off-axis color and contrast shifting, and brightness

- Contrast: difference between darkest black and brightest whites

- Refresh rate and response time

- Cost

LCD Panel Pros and Cons

	TN	**IPS**	**VA**
	Twisted Nematic TN-Film	In-plane Switching S-IPS, H-IPS, e-IPS, P-IPS, PLS	Patterned Vertical Alignment MVA, PVA, AVMA
PROs	Fastest response - 1 ms Lowest cost OK contrast	Best color accuracy Widest viewing angels No color/contrast shift OK response - 4 ms	Best contrast Wide viewing angles*
CONs	Narrow viewing angles Worst color accuracy	Lower contrast Motion blur Panel glow	Slow response - 10 ms *Color/contrast shift
Best for	Best gaming Entry-level General use	Best all around Color critical activities Technology enthusiasts	Best multimedia hub Content creation TVs, movies

Other Considerations

▶ Connectivity

NEW

  ▶ USB-C, Thunderbolt

RECENT

  ▶ HDMI 1.3, HDMI 1.4

  ▶ DisplayPort, Mini display port

OLDER

  ▶ DVI

  ▶ VGA (ancient)

▶ Other features

  ▶ Multiple color profiles

  ▶ Hood / shade

  ▶ Stand: height, articulation, stability

  ▶ Rotation, tilt

  ▶ USB ports, card reader

Another Recap

	Good	**Better**	**Best**
Size	24"	27"	32"
Resolution	FHD 2.1MP 1920 x 1080	QHD 3.7MP 2560 x 1440	4K 8.8MP 4096 x 2160
PPI	94	120	145
Gamut	100% sRGB	95-100% Adobe RGB	>100% Adobe RGB
Bits Colors	8 bit 16.8 million	8 bit FRC or 10 bit 1.1 billion	10 bit FRC > 1.1 billion
LUT	-	>10 bit	14 bit 3D
Panel	IPS	IPS	IPS
Inputs	Display Port	HDMI 1.4	USB-C / Thunderbolt
Other	Card reader	Hood	Integrated calibration
Cost	$200 - $300	$500 - $800	$1,200 - $6,000

Top 10 Monitor Lists

- https://fstoppers.com/gear/2017-monitor-buyers-guide-photographers-top-recommendations-205268

- https://www.digitalcameraworld.com/buying-guides/best-monitors-for-photographers

- https://www.pcmag.com/article2/0,2817,2402114,00.asp

- https://camerajabber.com/best-monitor-for-photo-editing/

- https://photographylife.com/best-monitor-for-photography

- http://www.monitorsforphotoediting.com/best-monitor-for-photo-editing/

- https://turbofuture.com/computers/Under-500-Photo-Video-Editing-Monitor

- https://www.tomshardware.com/reviews/best-professional-monitors,4612.html

- https://topbestreviewss.com/electronics/best-4k-monitors-for-photo-editing/

- Etc., etc., etc.

Recommended Monitors

Fstoppers
Nov. 2017 Monitor Buyers Guide for Photographers   Link

Category	Model	Cost	Size	Resol	PPI	AdobeRGB	Color	LUT	cd/m^2	Response
Budget Photo	ViewSonic VX2370SMH	$130	23"	FHD	96	No	8 bit / 16.7M	-	250	14 ms
Mid-Range Photo	BenQ GW2765HT	$299	27"	QHD	109	79.1%	8 bit FRC / 1.1B	-	350	4 ms
High-End Photo	BenQ SW2700PT *	$599	27"	QHD	109	99.3%	10 bit / 1.1B	14 bit 3D	350	4 ms
Enthusiast < $1.5K	NEC PA272W	$1,299	27"	QHD	109	99%	10 bit / 1.1B	14 bit 3D	340	6 ms
Top of the Line > $1.5K	NEC PA322UHD	$2,599	31.5"	UHD	140	99.2%	10 bit / 1.1B	14 bit 3D	350	10 ms

Note: Zero 4k monitors on this list   4K

* "A perfect monitor for photo editing" Fstoppers, May 30, 2018
  https://fstoppers.com/originals/review-benq-sw2700pt-perfect-monitor-photo-editing-226520

"If you've been monitor shopping this past year, the allure of affordable sub-$500 4K monitors might be hard to beat. Sure, you can get some 4K monitors for closer to $300, but for us photo nerds, $500 is the number to beat for the slightly better panels that aren't so cheap we'll regret it. That said, the affordable 4K display market still has some work to do on the quality end. And at the end of the day, do you really need 4K? You might think you do, but trust me: you don't.

Far more important than going up to a 4K-resolution monitor is getting your colors to be right and having a set of features that will fit your professional needs. That's exactly what BenQ addresses with its SW2700PT 27-inch 2K QHD monitor."

Monitor Calibration

Why Calibrate?

- So your work products consistently turn out as anticipated
    - Color, saturation, monochrome tonality, contrast, brightness
    - Especially critical for printed materials
- "Almost without exception computer monitors are kept brighter than a calibrated screen"
- Most monitors are not adjusted to any standard at the factory
- Monitor colors drift over time, especially bulb-lit monitors
- Ambient conditions affect our perceptions

- Adjust your monitor so its <u>color</u> and <u>brightness</u> agree with known standards using a colorimeter and matching software

Calibration Tools

X-Rite

- i-1 Display Pro $~~259~~ $209 – the gold standard: most accurate, fastest, most compatible, does projectors and TVs, and it's cheaper too

- ColorMunki Display $169

- ColorMunki Smile $81

DataColor

- Spyder5Elite $279

- Spyder5Pro $189

- Spyder5Express $129 – the best budget option (use with free DisplayCAL aftermarket software)

Note: the Spyder5 is significantly better than all of its predecessors

Calibration Process

▶ Stabilize the monitor for 30 minutes - "critical"

▶ Install and load the software

▶ Attach colorimeter to computer via USB and place it against the screen

▶ Run the program

▶ Manually adjust brightness and contrast

▶ The system will automatically create a (selectable) ICC profile, which is loaded each time you boot your machine (or update the on-board LUT table that is integrated into your monitor)

▶ Repeat this "at least once a month"

Calibration Demonstration

▶ Critical settings:

Color temperature: 6500° kelvin, aka 6500K, aka "D65"

Brightness: 120 cd/m^2

Gamma: 2.2

Gamma is the rate at which shades appear to increase from black to white. Gamma compensates for the non-linear way PCs change brightness

1.8 was the previous Macintosh default

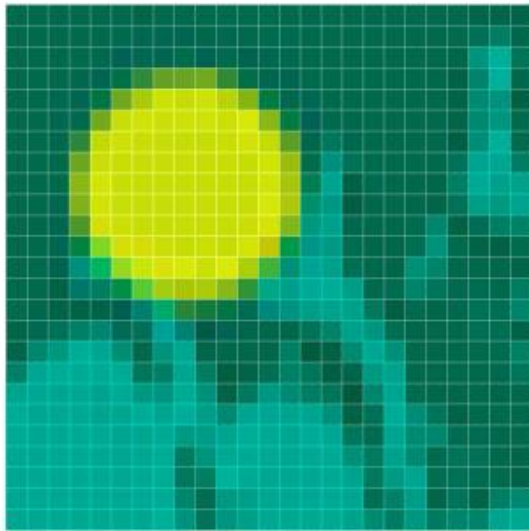1.8 shows more shadow detail and may be closer to printed results

▶ Create the profile and save it

▶ Compare profiles

Supplemental Materials
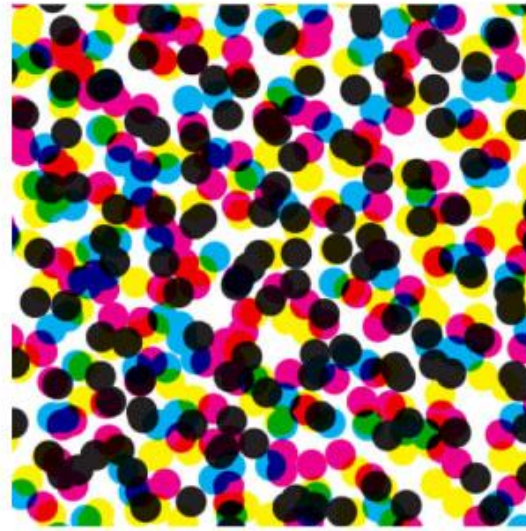
Technically, PPI ≠ DPI
but they're used interchangeably

Pixels Per Inch PPI

A close up of a Bitmap image shows the individual pixels.

Dots Per Inch DPI

A close up of a print shows the overlay of ink drops to form the image.

Pixel Density

PPI = pixels per inch; higher PPI is better

Dot pitch = width of a pixel (in mm); having smaller pixels gives better detail
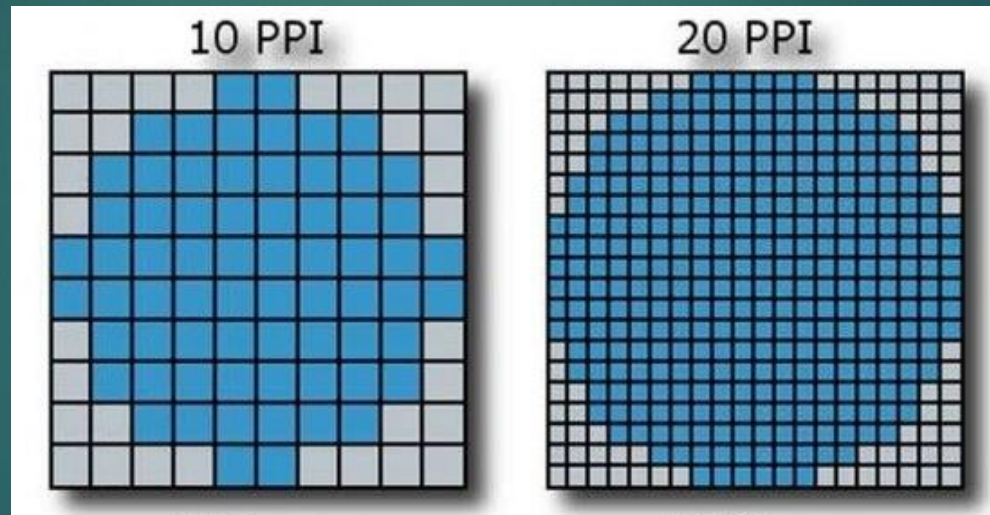
Dot pitch
25.4mm/10 pix =
2.5mm/pixel

Dot pitch
25.4mm/20 pix =
1.3mm/pixel

10 PPI

20 PPI

1" = 2.54 cm = 25.4mm

Resolution

300 dpi
Sharpest Quality

200 dpi
Great Quality

100 dpi
Good Quality

PPI Examples

PPI for Popular Devices

FindTheBest
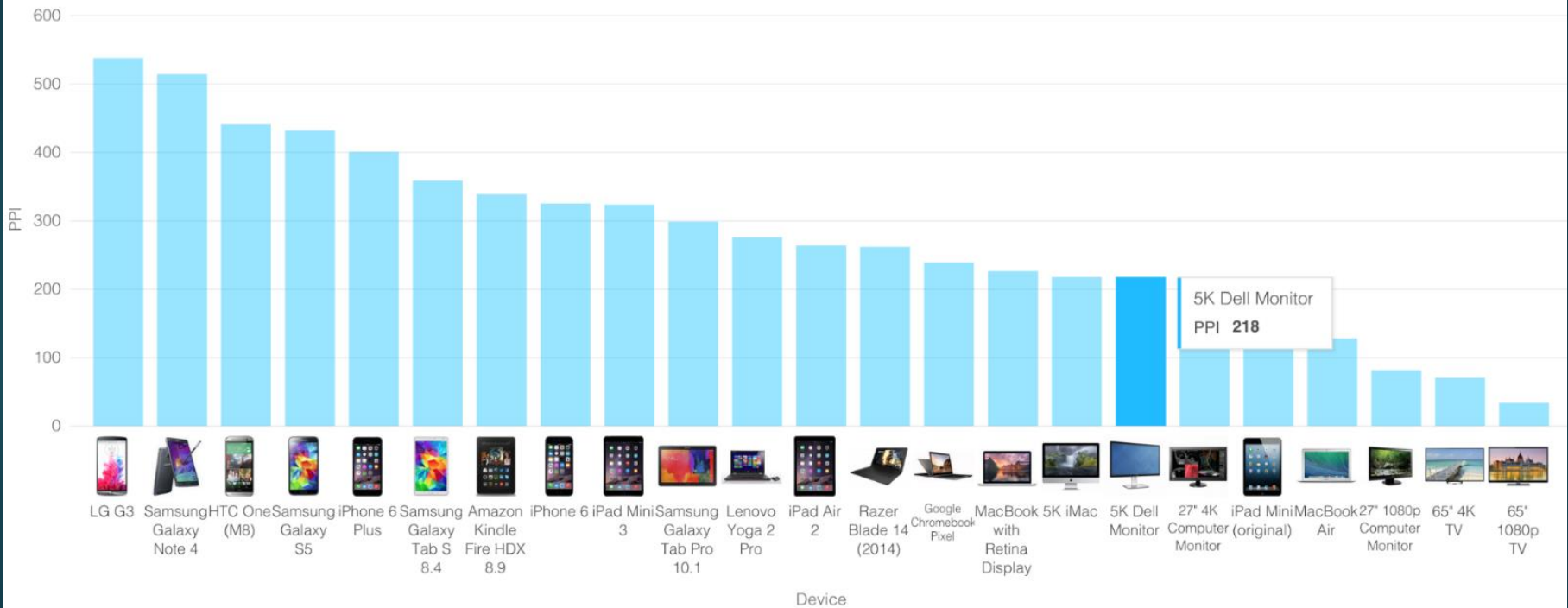
Aspect Ratio

Aspect ratio is simply the ratio of width to height
Note that all of these boxes have the same diagonal "size"

4:3
1.33

16:10
1.6

21:9
2.33

16:9
1.78

Aspect Ratio: Typical Purposes

5:4 Computer Displays	4:3 SDTV / Video Computer Displays	3:2 35mm Film DSLR Cameras Smartphones	16:10 Widescreen Computer Displays Smartphones
16:9 HDTV Widescreen SDTV Smartphones	1.85:1 Cinema Film (US)		2.35:1 Cinemascope

Aspect Ratio

These are the dimensions and areas of a 24" monitor in various aspects

259 sq. in.

24"

12.7"

20.4"

16:10   Assume 100%

276 sq. in.

24"

14.4"

19.2"

4:3   7% more area

246 sq. in.

24"

11.8"

20.9"

16:9   (5%) less area

208 sq. in.   24"

9.4"

22.1"
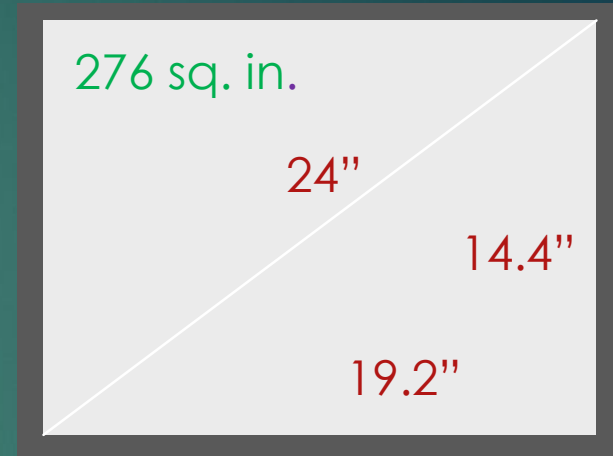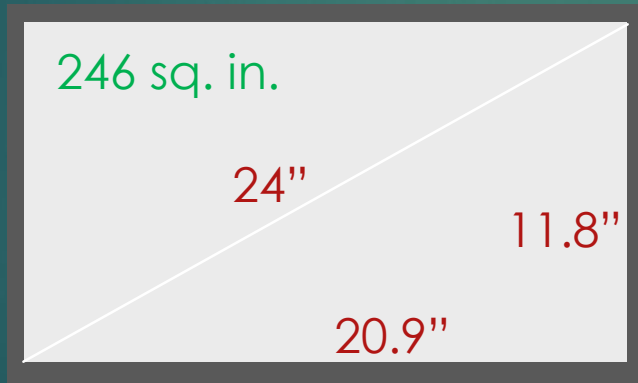
21:9   (20%) less area

Aspect Ratio: Screen Utilization

If we assume that a typical 3:2 aspect photo image on a 4:3 screen is "full utilization," then a 16x9 format monitor of the "same size" shows that image 14% smaller

27" 4:3

3:2 image
100%

27" 16:10

Image size is 99% of the image on a same-size 4:3 monitor

27" 16:9

Image size is only 86% of the image size on a same-size 4:3 monitor

The 16:9 image size is only 86% of the same image on a 4:3 monitor
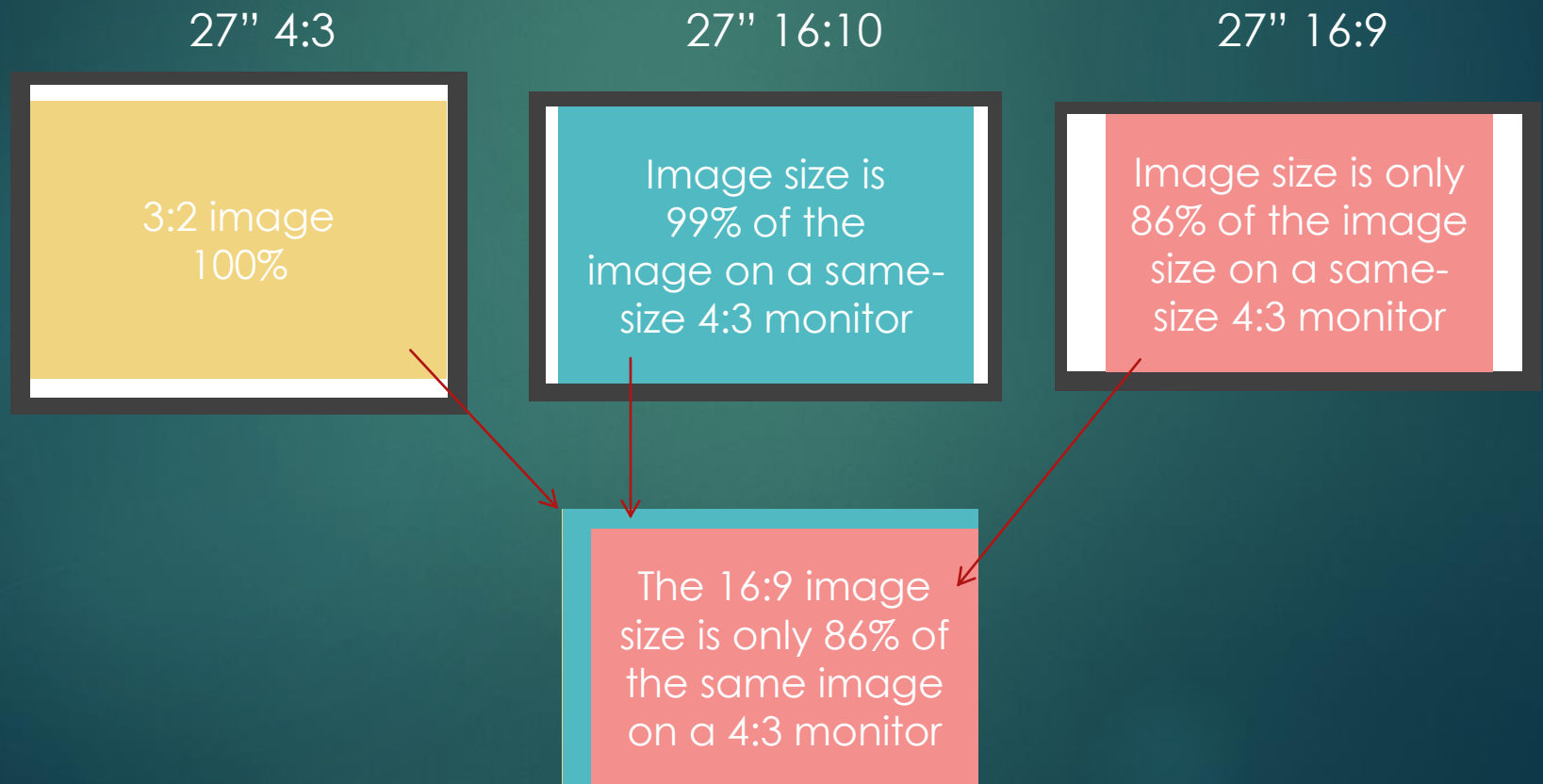
Refresh Rate vs. Response Time

- Don't worry about these unless your gamer also uses this machine
- Refresh rate (e.g. 60-240 Hz): this is how many times the screen refreshes per second.
  - Higher rates are better for smoother action (think: avoid rolling shutter artifacts)
  - A feature called V-sync help this, but adds processing overhead
  - Refresh rate below 60 Hz can cause a visible and fatiguing screen flicker
  - >75 Hz is great for general use including photo editing
  - But 144 Hz is the current gaming sweet spot
  - Tearing: the screen can't keep up with the graphics card and jumps ahead creating an artifact. Example on next slide
- Response time (e.g. 1-15 milliseconds): this is how long it takes for a requested screen change to occur
  - 10 ms or even 15 ms is fine for photo editing
  - 4 ms is acceptable for most games and just about everything else
  - 1 ms is the standard for the highest gaming performance (requires TN panel)

Tearing

Monitor refresh rate isn't keeping up with source data:

Contrast

- Contrast is the ratio of the brightest luminance divided by the darkest luminance in candelas per square meter (cd/m^2)

- <u>Static</u> contrast is tied to the native ability of the panel

- <u>Dynamic</u> contrast is a switchable feature that turns darks and brights to unnatural levels, allowing "creative" levels of performance

- My highly regarded photo editing monitor has 1,000:1 static contrast and 20 million:1 dynamic contrast

- According to one site 850:1 is a minimum for photo editing and 1,000:1 is good. 1,000:1 seems to be very common

Brightness

- Monitors now routinely have brightness capabilities above 300 cd/m^2 but if you process your photos above 110 or 120 cd/m^2 the outputs will probably appear too dark on everybody else's computers and when printing photos

- Solve this by calibrating your monitor using a colorimeter

- Alternatively, here is a creative on-line suggestion

  - Use your camera meter to adjust your monitor

  - Set your camera in front of your monitor with a normal lens. Fill the frame with a pure white computer screen

  - Set the camera manually to ISO 100, f/11, 1/4 sec.

  - Adjust your monitor brightness until the camera says you have a proper exposure at those settings

Uniformity

Some monitors have a problem with uniformity (uneven brightness), and panel glow, especially when viewed off axis