

Intro to Digital Printing

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Digital printing?

- Digital printing refers to printing (specifically photographs in our case) where at least one step is entirely in the digital realm.
- Two main methods of digital printing
 - Digital C Print
 - i.e. pictures from Target, Wal-Mart, or Walgreens
 - Inkjet
 - i.e. Epson, Canon, Hewlett-Packard

Digital C Print

- Made with a digital enlarger that exposes light-sensitive type C photographic paper with LEDs.
- The photo paper is processed in RA-4 chemistry creating a continuous-tone, true photographic print.
- The LEDs use the numbers in your digital file to determine how to expose the paper.

Digital C Print: Positives

- Can be made from digital files or film by dropping off at local big box retailer.
- Many retailers, such as Walgreens, even allow you to upload images online and anyone can print them out from anywhere.
- Cheapest option for printing many small images.
- Little-to-no experience required.

Digital C Print: Negatives

- Poor archival stability
 - stability~60 years under best conditions according to Wilhelm Institute
- Stuck with “standard” print sizes
 - i.e. 4”x6”, 8”x10”
- Lack of control in options.
 - Machine operator skill.
 - Machine settings.
 - Color management issues.

Inkjet Prints

- Print made from an inkjet printer which uses a printhead to deposit dots of ink on a substrate (usually paper).
- Laser printers are not inkjet printers; they use a negative electrostatic image to pull positively charged toner onto the paper. There are no mainstream archival photographic laser printers in production.

Inkjet Prints: Dye vs. Pigment

- Inkjet printers can use either dye or pigment inks.
- Pigment inks were introduced to solve the issue of permanence.
- Dye inks have a greater gamut and the possibility of a higher dMax. They are also NOT archival.
 - Color gamut: the colors which can be accurately represented
 - dMax: a logarithmic measure of the darkest black possible

Inkjet Prints: Positives

- There is a wide variety of paper available.
- Prints can be made in any size and shape.
- Printing can be done from home at any time of the day or night.
- You are in complete control.
 - While you can have a lab make inkjet prints for you, most experience with inkjet printing is at home which means you are in control of everything.

Inkjet Prints: Negatives

- You are in complete control.
 - Since you control every step of the process there are lots of places where you can take a wrong turn.
- Unless you are running a printer with large-volume ink cartridges, making lots of prints can be very expensive.
 - Most manufacturers sell their printers near cost and make their profits on ink. Per volume, printer ink is more expensive than gold.
 - A new court ruling makes 3rd party ink cartridges a patent infringement.
- If you don't print often, inkjet printers can clog and require more precious ink to clear the clogs.

Which one is for me?

- Inkjet allows for more control at a higher cost and a longer archival life.
- Digital C prints require less work and are cheaper, though you are limited in paper choice.
- If you are making lots of 4x6 prints then digital C prints are more cost effective.
- Desktop inkjet printers now offer automated systems which work with the ease of digital C printing, but you lose the control.
 - More expensive than digital C printing.
 - Can be more convenient as prints are made at home.

Resolution: What is it?

- Resolution refers to the density of pixels in an image.
- It is a measurement of height by width at a certain pixel density (ppi).
- Digital images have no real absolute size or resolution, only a certain number of pixels in each dimension.
- If you change the physical size of the outputted print you change the resolution.

PPI? DPI?

- PPI: pixels per inch.
- DPI: dots per inch.
- These terms are incorrectly used interchangeably, but refer to two entirely different measurements.
 - PPI is used when the image is still in the computer as you are measuring pixel density.
 - DPI is used when speaking about physical prints as you are talking about an actual number of dots of ink per inch.

So... what does this mean to me?

- A digital camera or film scan only gives you a finite number of pixels.
- Think of this total number of pixels as a tube of icing.
 - Icing a cookie and you only need some of the icing to cover the entire delicious treat (such as Nancy's fancy cookies... have another!)
 - Icing a sheet cake with the same tube and you may not be able to cover the entire cake!
- If you stretch your pixels too thin then the quality of the picture suffers, just like your cake.

Resolution application

- A file that is 1500 pixels x 2100 pixels can be:
 - 15" x 21" at 100 ppi,
 - 7.5" x 10.5" at 200 ppi, or
 - 5" x 7" at 300 ppi.
- Most inkjet printers work best with images which are at least 300 ppi.
- Most digital C printing machines work best with images which are at least 240 ppi.

What if I don't have enough pixels?

- If you don't have enough pixels to print at a certain size then the printer will interpolate, or create, the pixels needed to fill in the gaps.
 - Some printers and programs have better algorithms than others for creating these pixels.
 - There is a quality loss, but it is up to you what is acceptable.
- This is one of the factors which causes the poor quality in images printed from the internet.

So how big can I print?

- West Coast Imaging (www.westcoastimaging.com) has very good chart for deciphering maximum print sizes from different megapixel cameras.
- When buying a camera choose one which will make images of a quality you want at the sizes you want.

		PRINT SIZE								
		8x12	11x14	16x20	16x24	20x30	24x36	30x45	40x60	50x75
CAMERA RESOLUTION	2MP	133	114	80	66	60	53	35	26	21
	3MP	193	165	115	96	77	64	51	38	30
	4MP	205	176	123	102	82	68	54	41	32
	5MP	216	185	129	121	86	72	57	43	34
	6MP	250	214	150	125	100	83	66	50	40
	7MP	256	219	153	128	102	85	68	51	40
	8MP	259	222	155	129	103	86	69	51	41
	9MP	290	249	174	145	116	96	77	58	46
	10MP	322	276	193	161	129	107	86	64	51
	11MP	338	290	203	169	135	112	90	67	54
	12.7MP	364	312	218	182	145	121	97	72	58
	16.6MP	416	356	249	208	166	138	110	83	66
	18MP	408	350	245	204	163	136	108	81	65
	21.1MP	468	401	280	234	187	156	124	93	74
	22MP	457	392	274	228	182	152	121	91	73
	31MP	541	464	324	270	216	180	133	108	86
	39MP	601	515	360	300	240	200	160	120	96
	63MP	812	696	487	406	324	270	216	162	129
	35mm*	590	515	354	295	236	196	157	118	94
6x6cm	944	809	566	472	377	314	251	188	151	
6x7cm	956	820	574	478	382	318	255	191	153	
4x5	988	847	592	494	395	329	263	197	158	
8x10	1383	1186	830	691	553	461	368	276	221	