

Color for Print

ART 220 · Digital Illustration · Session 13

V2
10.06.26

Workhorse Collective

ART 220 · Fall 2026

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Today 10.06.2026
Topic How color works as light and as ink, how screens and printers make it, and how to set up the inks for your poster.

Your screen makes color by adding light. Paper makes color by taking it away.

01 · Light

What color is, why there are three main colors of light, and how screens got from the first TV to your phone.

02 · Ink

Why printers use cyan, magenta, yellow and black, and how printing has worked, from carved wood blocks to the office printer.

03 · Riso and screen

The risograph and screenprinting, two ways of printing by pushing ink through a stencil, and where they came from.

04 · Your poster

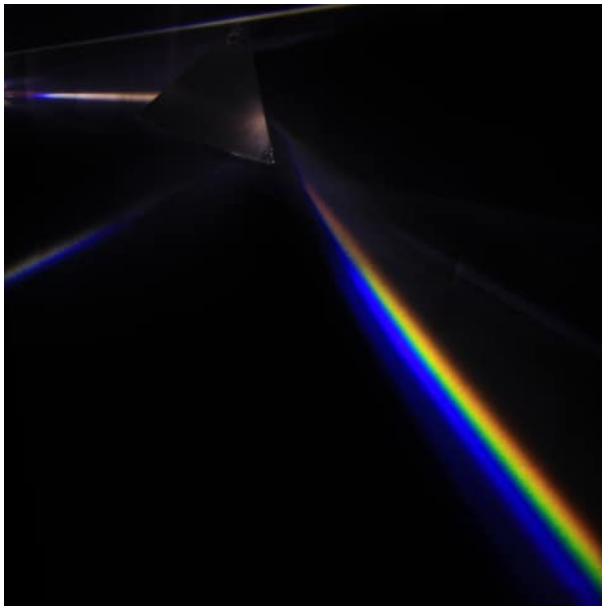
How a few inks and the paper work together, how to set up your file for Oct 15, and then work time.

Color is light

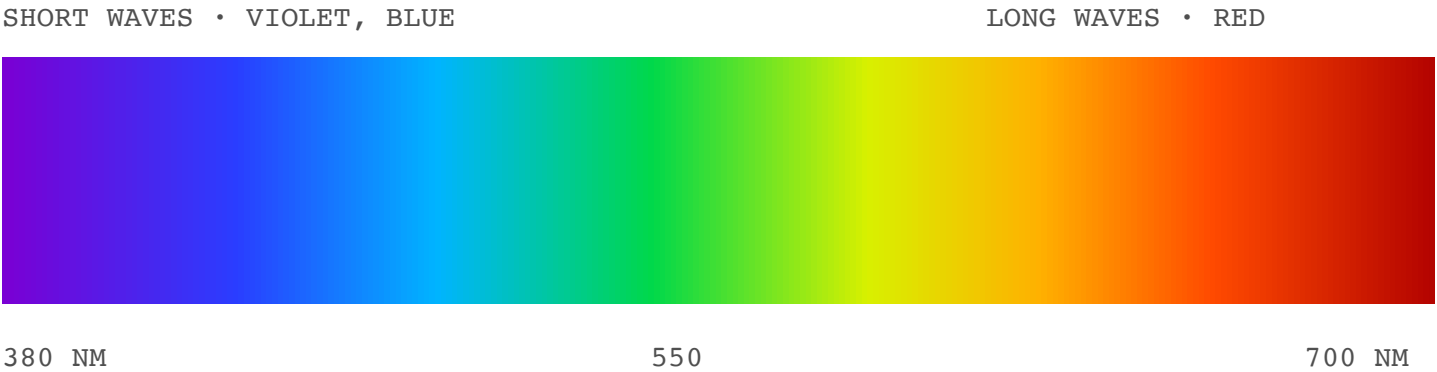
Before we get to screens and ink, here is what your eye is doing when it sees a color.

White light is every color at once.

In 1666 Isaac Newton shined sunlight through a glass prism, and it split into a rainbow. A second prism turned the rainbow back into white light. That means an object does not have a color of its own. It reflects part of the light that hits it, and that part is the color you see.



A PRISM
D-Kuru · Light dispersion of a mercury-vapor lamp with a flint glass prism · 2009 · D-Kuru, CC BY-SA 3.0 AT, via Wikimedia Commons

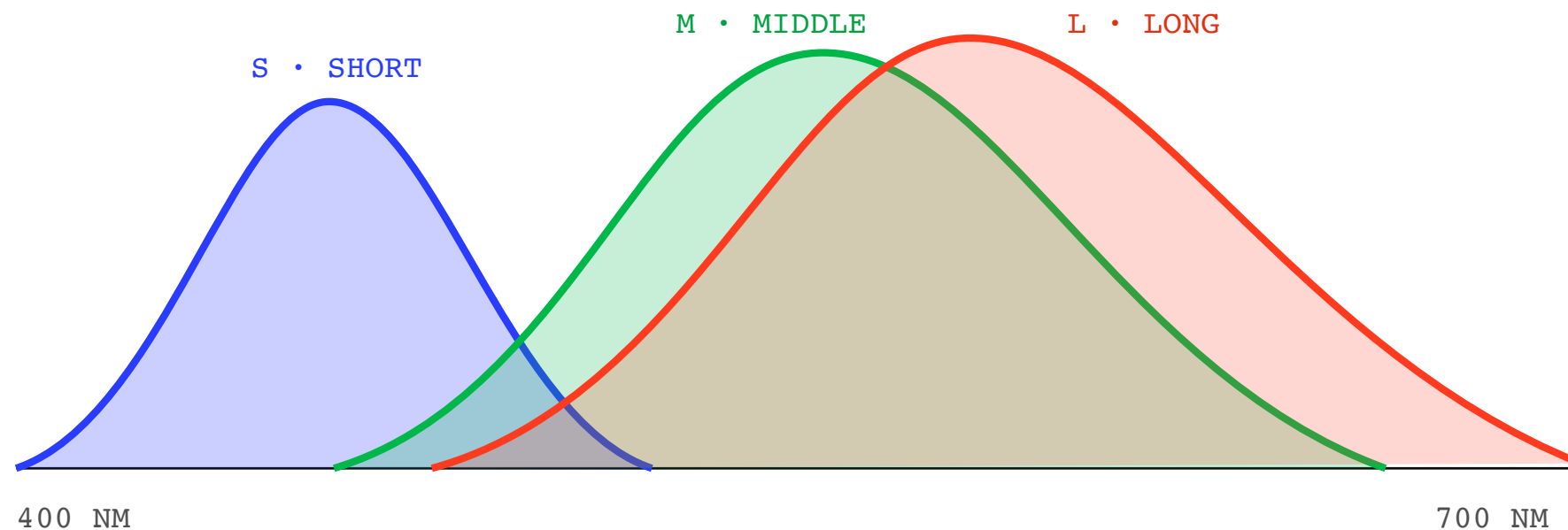


The colors in white light, in order.

THE VISIBLE SPECTRUM
WAVELENGTH IN NANOMETERS

Your eye only has three color sensors.

Your eye has three kinds of color cells. One sees mostly blue, one mostly green, one mostly red. Every color you see is your brain mixing those three signals. That is why screens and printers both start from three colors.

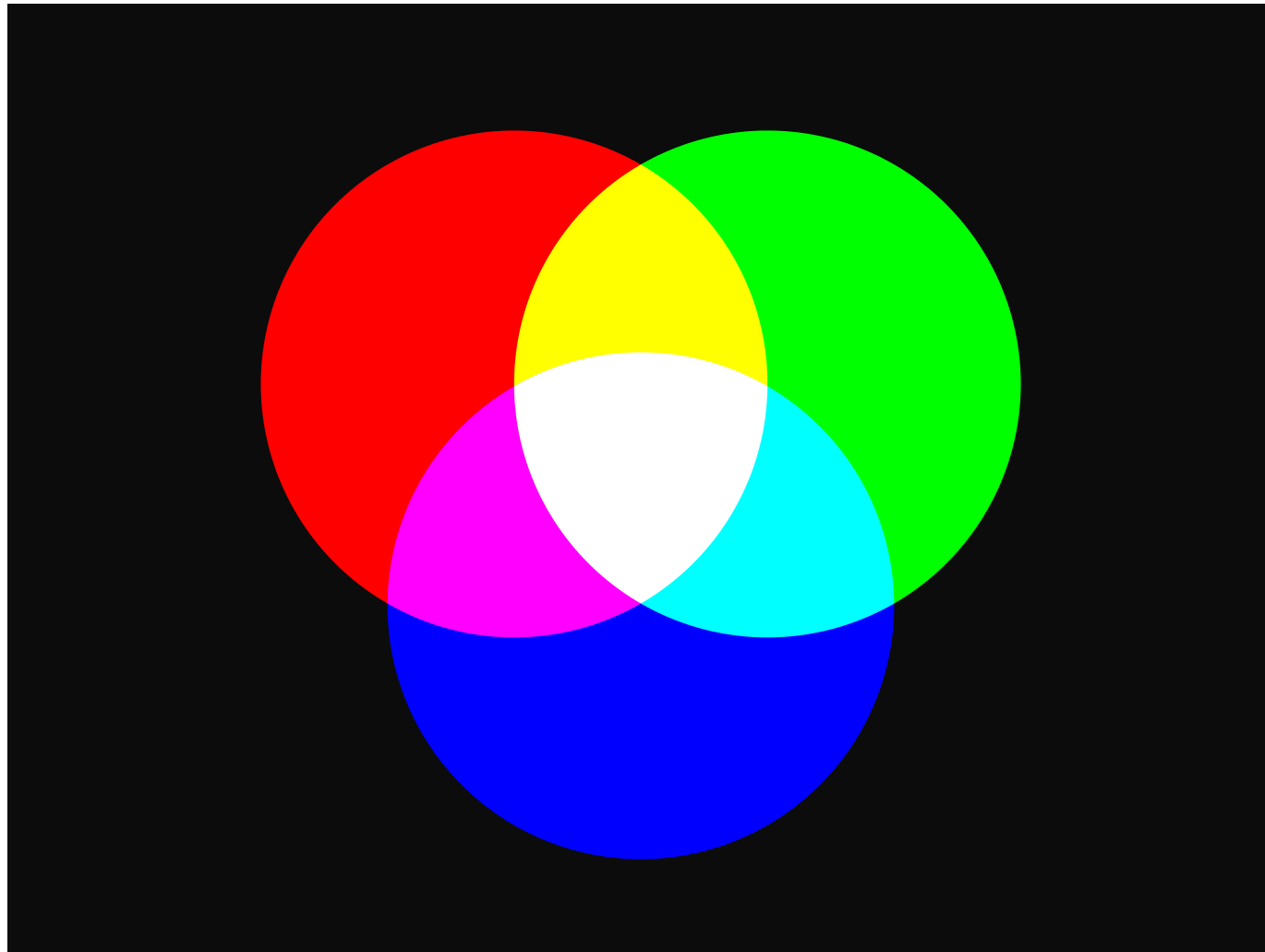


THE THREE CONES
OVERLAPPING, WHICH IS WHY MIXING WORKS

Why three colors. A screen mixes three colors of light. A printer mixes three inks, plus black. Both are made for the same three cells in your eye.

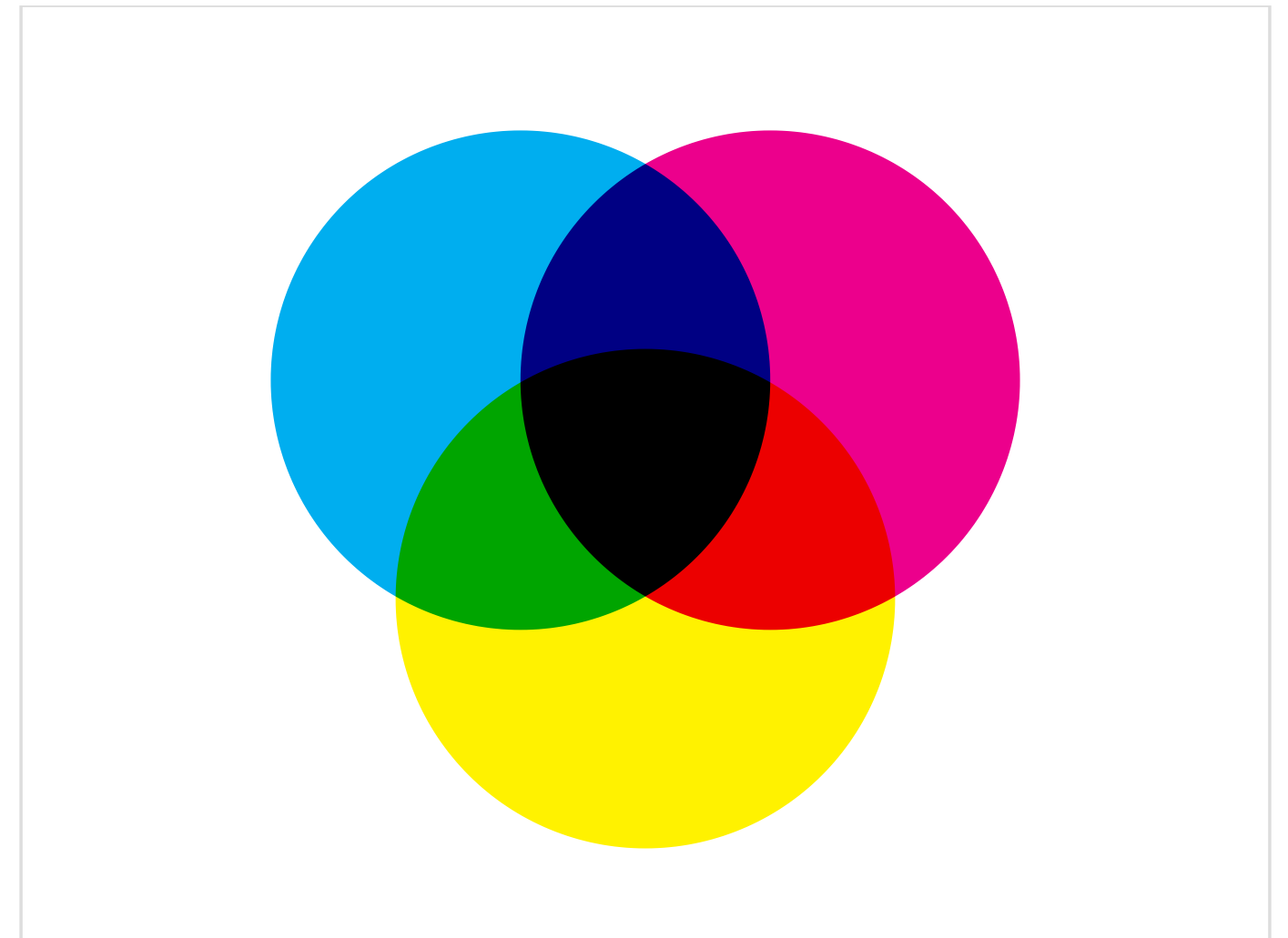
Some people have only two working kinds. That is color blindness, and it is why a poster should never depend on red against green alone.

Two ways to make a color: add light, or take it away.



ADDING LIGHT · RGB

START WITH A DARK SCREEN AND ADD RED, GREEN AND BLUE LIGHT. ALL THREE TOGETHER MAKE WHITE. SCREENS, PROJECTORS AND STAGE LIGHTS WORK THIS WAY.



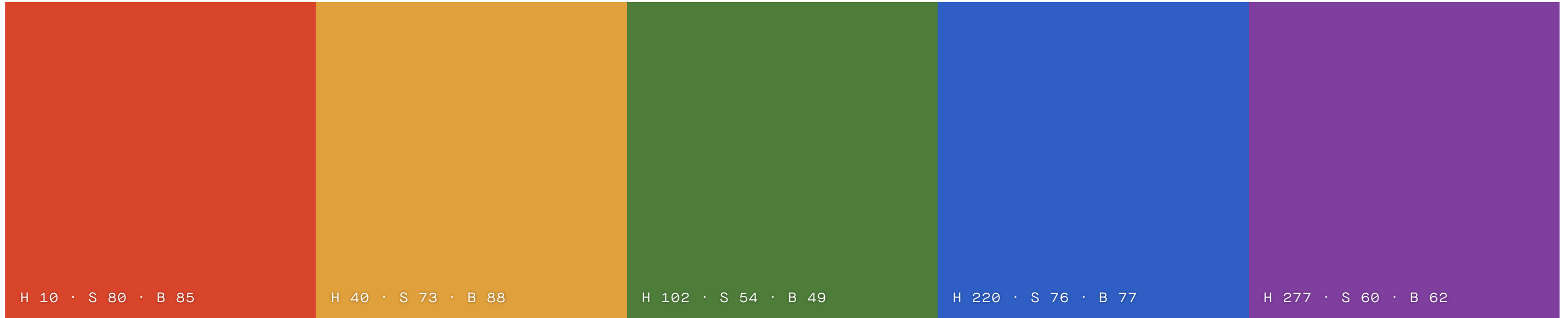
TAKING LIGHT AWAY · CMY

START WITH WHITE PAPER. EACH INK BLOCKS SOME OF THE LIGHT, AND ALL THREE TOGETHER MAKE A DARK, MUDDY COLOR. PRINTING, PAINT AND MARKERS WORK THIS WAY.

LOOK WHERE THEY OVERLAP. RED AND GREEN LIGHT MAKE YELLOW. CYAN AND YELLOW INK MAKE GREEN.

From session 6: three numbers for any color

HUE · SATURATION · BRIGHTNESS



Hue is which color. Saturation is how strong it is. Brightness is how light or dark it is. These are the same colors as RGB, described in a way that is easier to adjust. Brightness still decides whether a poster reads from across the room, on screen or on paper.

Screens add light

Every color screen is made of tiny red, green and blue lights, too small to see one at a time. Here is how screens got from the first TV to your phone.

The first color photograph was three black and white ones.

In 1861 the scientist James Clerk Maxwell photographed a plaid ribbon three times: through red glass, green glass and blue glass. He projected each photo back through its own color of glass, lined them up, and the ribbon appeared in color. Every color screen since works the same way.

Three photos

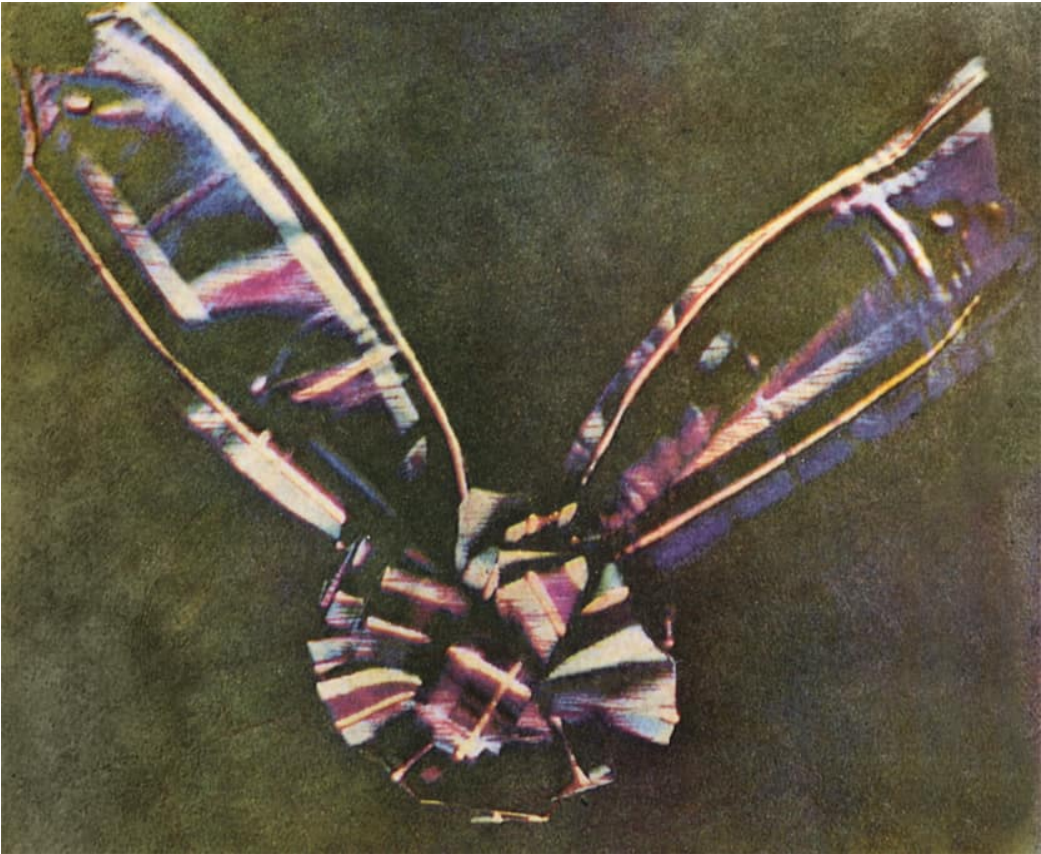
R · G · B

Each photo shows how much red, green or blue is in each part of the picture.

Three lights

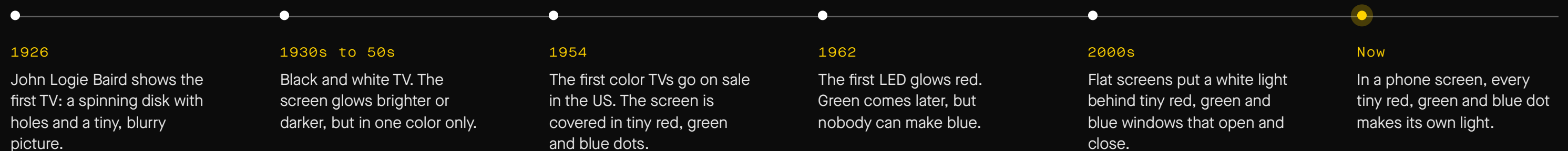
ADDED BACK

Shine each photo in its own color of light, stack them, and you get full color.



THE TARTAN RIBBON, 1861

One hundred years of putting light on a screen.



EVERY ONE OF THESE USES THE SAME IDEA: RED, GREEN AND BLUE LIGHT, TOO SMALL TO SEE APART.

Screens · tubes

A black and white TV used one light. A color TV used three.



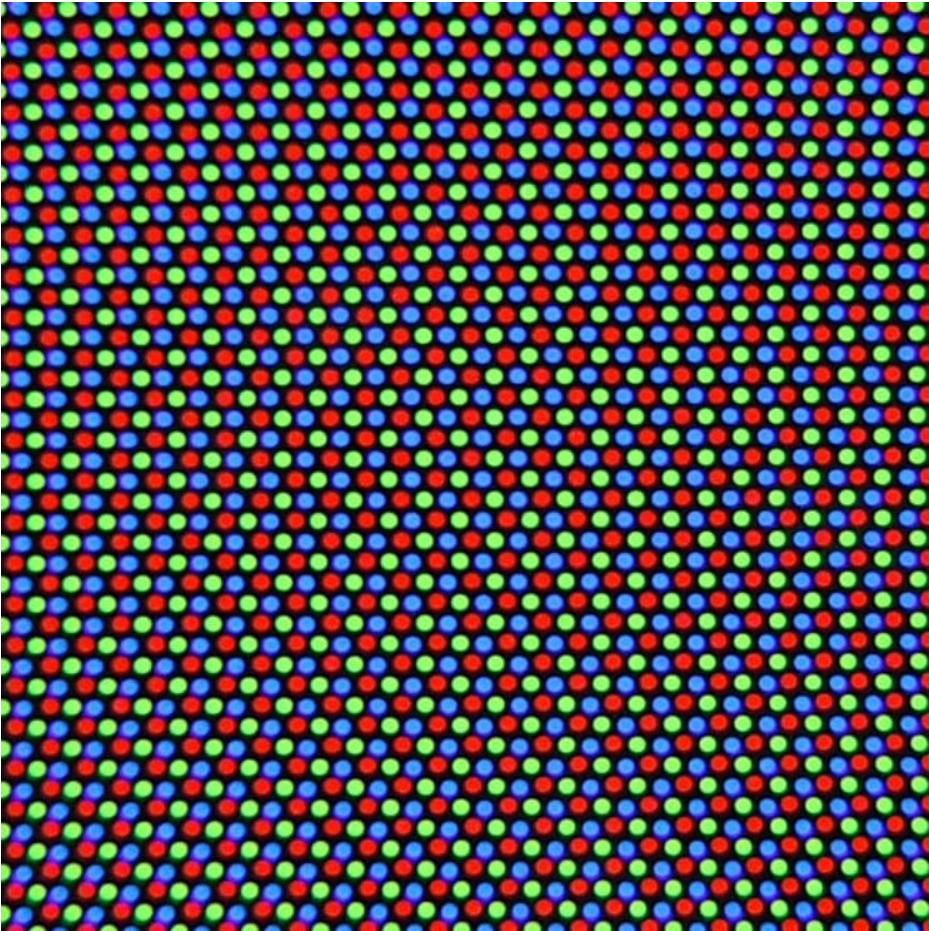
THE FIRST TV, 1920S
A SPINNING DISK

Baird Television Ltd (photo: Matt Brown) · Baird Televisor, 1929 · 1929 · Matt Brown, CC BY 2.0, via Wikimedia Commons



AN EARLY COLOR TV, 1953 TO 54
RED, GREEN AND BLUE DOTS

RCA Victor (photo: Ethan Long) · RCA Model 5 Color TV Prototype · 1953-1954 · Ethan Long, CC BY-SA 2.0, via Wikimedia Commons



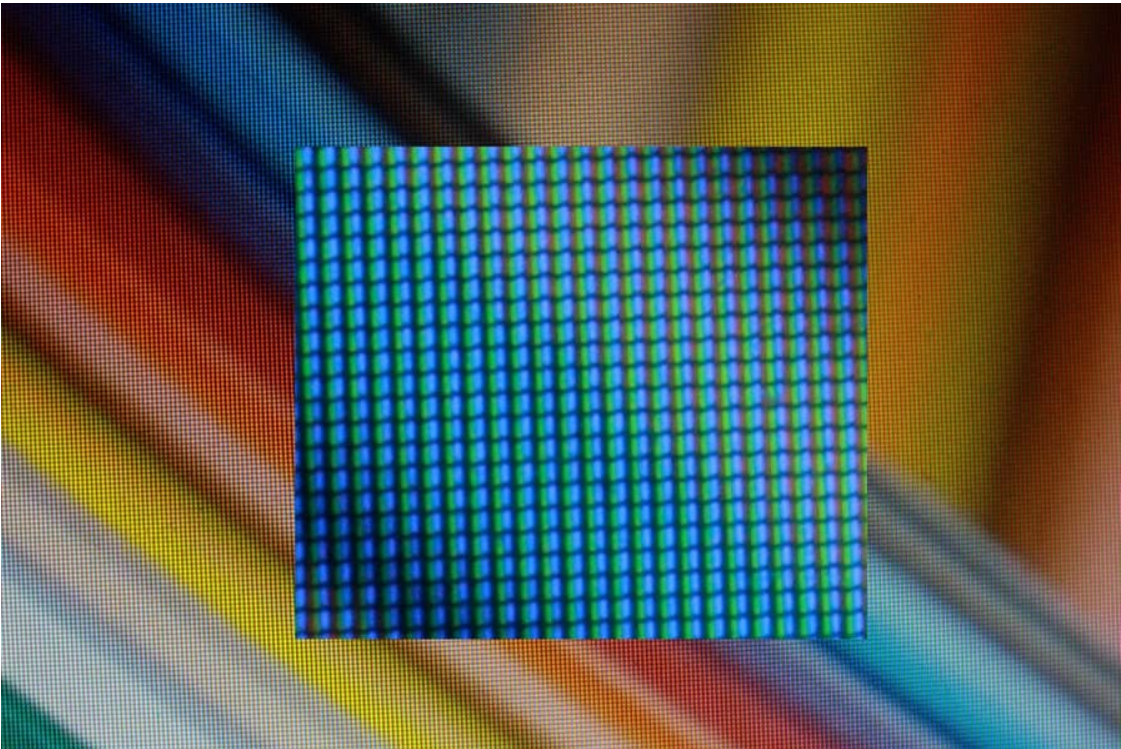
UP CLOSE
RED, GREEN AND BLUE DOTS

Marcin Floryan · CRT screen closeup · 2007 · Marcin Floryan, public domain, via Wikimedia Commons

Look at your own screen.

Open a white page on your laptop. Point your phone camera at it, zoom all the way in, and look. On a white screen, red, green and blue are all on. On yellow, red and green are on and blue is off.

Laptop screen LCD	A white light behind the screen, and tiny shutters over red, green and blue windows.
Phone screen OLED	Every tiny dot makes its own light and can turn fully off. That is why black on a phone looks so black.
Your file RGB	Every color you pick on screen is three numbers, from 0 to 255: how much red, green and blue light.



SUBPIXELS, MAGNIFIED
Politelyinsulting · LCD subpixels · 2014 · Politelyinsulting, CC BY-SA 3.0, via Wikimedia Commons

For thirty years, nobody could make a blue LED.

An LED is a tiny chip that glows when electricity runs through it. The material it is made of decides its color. Red LEDs worked in 1962, and green ones came later. Blue needed a material nobody could make well, and the biggest companies in the world tried and failed. Without blue, there is no white LED and no full-color LED screen.

The material

GALLIUM NITRIDE

The right material for blue was a crystal called gallium nitride. Most scientists decided it was impossible to make it pure enough.

The missing half

TWO LAYERS

An LED needs two different layers stacked together. Nobody could make the second layer out of this crystal.



An aside · the blue LED

An engineer at a small chemical company did it anyway.

WHEN	WHAT HAPPENED
1989 NAGOYA	Isamu Akasaki and Hiroshi Amano, two university scientists, finally make the missing second layer.
Early 1990s NICHIA, TOKUSHIMA	Shuji Nakamura, an engineer at a small company, rebuilds his equipment by hand, finds an easier way to make that layer, and makes much purer crystals.
1993 THE RESULT	Nichia sells a bright blue LED and makes a fortune. Nakamura's bonus for the invention is 20,000 yen, about \$180.
2004 to 2005 THE COURT	He sues his company. A court awards him 20 billion yen. They settle for about 840 million yen, around \$8 million.
2014 STOCKHOLM	All three share the Nobel Prize in Physics.



SHUJI NAKAMURA
Glenn Beltz · Professor Shuji Nakamura · 2014 · Glenn Beltz, CC BY 2.0, via Wikimedia Commons

An aside · the blue LED

Blue made the white LED possible.

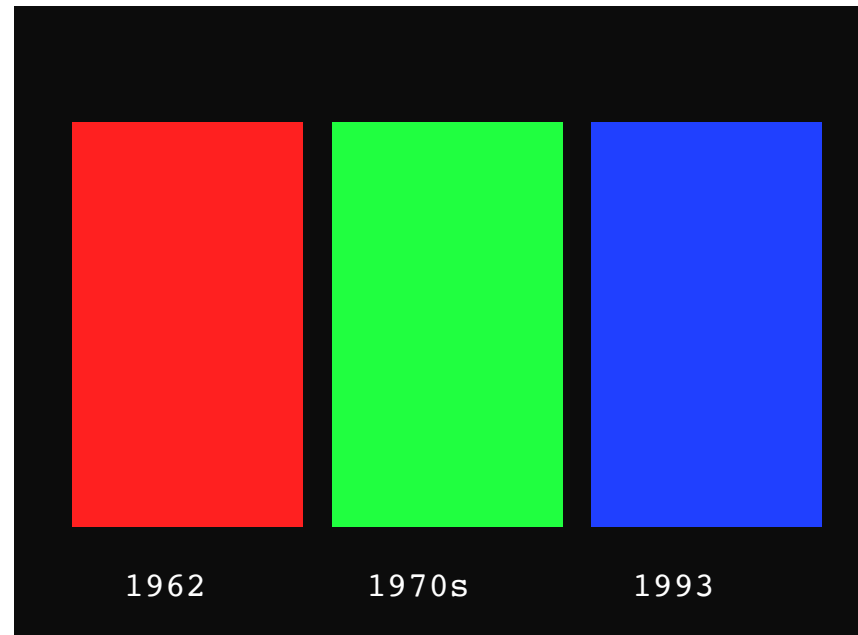
Coat a blue LED with a yellow layer and the light comes out white. That is what lights LED bulbs, the backlight in every laptop, and phone screens bright enough to read outside, including the screen you made your poster on.



A WHITE LED

BLUE CHIP, YELLOW COATING

Philip Bosma · Close-up of a white LED · 2007 · Philip Bosma, CC BY-SA 3.0, via Wikimedia Commons



THE THREE LIGHTS

RED, GREEN, AND FINALLY BLUE

Watch later: Veritasium, "Why It Was Almost Impossible to Make the Blue LED."

[youtube.com/watch?v=AF8d72mA41M](https://www.youtube.com/watch?v=AF8d72mA41M)

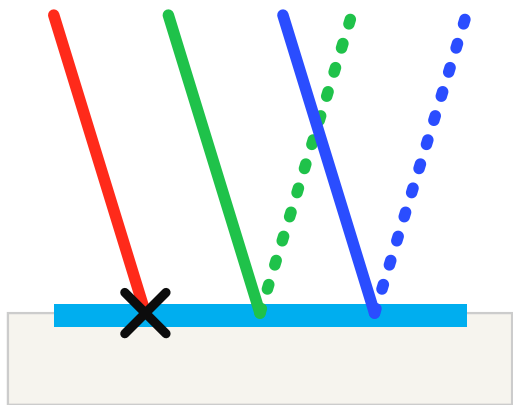
Also: the Nobel Prize page for 2014, which explains it in plain words. [nobelprize.org](https://www.nobelprize.org)

Ink takes light away

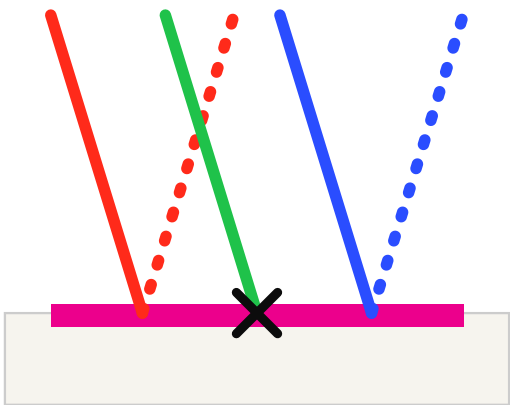
White paper bounces back all the light that hits it. Ink on top blocks some of that light. What bounces back is the color you see.

Ink is a filter.

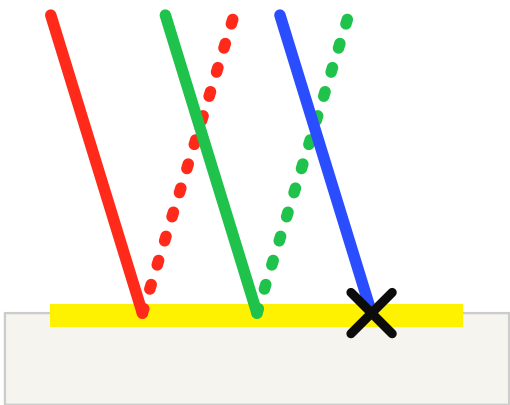
White light is red, green and blue together. Each printing ink stops one of the three. The paper bounces back the other two, and that is the color you see.



CYAN INK STOPS RED
GREEN AND BLUE BOUNCE BACK. YOU SEE CYAN.



MAGENTA INK STOPS GREEN
RED AND BLUE BOUNCE BACK. YOU SEE MAGENTA.



YELLOW INK STOPS BLUE
RED AND GREEN BOUNCE BACK. YOU SEE YELLOW.

Why these three

C · M · Y

Each one stops only one color of light, so mixing them can reach almost any color.

Why black too

K, FOR KEY

All three together make a muddy brown, not black. A black ink is darker, sharper and cheaper.

Where is white

NO INK

There is no white ink. White is the paper.

C, M, Y and K.

C, M and Y stand for cyan, magenta and yellow. Each one stops one color of light. K stands for key, the black plate that prints the fine detail.



Cyan

GREEK KYANOS, DARK BLUE

A greenish blue that stops red light.



Magenta

NAMED FOR A BATTLE, 1859

A purplish pink that stops green light. The dye was named after an 1859 battle near Magenta, a town in Italy.



Yellow

THE LIGHTEST INK

It stops blue light. Yellow is so light that it is the hardest plate to check by eye.



Key

THE KEY PLATE

The black plate. It prints the type and the outlines, and printers line the other three plates up to it. The letter is K so nobody mistakes it for B, for blue.

From red, yellow and blue to cyan, magenta and yellow.

Printers started with the painter's three primaries, red, yellow and blue, and later moved to three colors that mix better in ink.

1710s to 1725

LE BLON

Jacob Christoph Le Blon, a painter working in Amsterdam and London, prints pictures from three copper plates in red, yellow and blue, one over the other. Some prints get a fourth plate in black.

1869

DUCOS DU HAURON

Louis Ducos du Hauron, a French inventor, works out that ink mixes the opposite way from light, so each ink has to block one color of light. That idea leads to cyan, magenta and yellow.

1890s to 1900s

DOTS

The dot screen lets presses print photographs. Printers run three colors, then add a black plate for detail, which gives us four-color printing.

1900s on

BETTER INKS

Printers' red and blue inks shift toward magenta and cyan, which mix cleaner greens, blues and purples. In the 1970s, US printers agree on a standard set of the four inks so a magazine looks the same wherever it is printed.



LE BLON · NARCISSUS
Jacob Christoph Le Blon · Narcissus · 1710s · Yale Center for British Art, CC0, via Wikimedia Commons



DUCOS DU HAURON · AGEN, 1877
Louis Ducos du Hauron · View of Agen · 1877 · Public domain, via Wikimedia Commons

One picture, four plates.

Software splits a picture into four pages, one for each ink. Each page shows how much of that ink goes where. Printed on top of each other, the four pages rebuild the picture.



CYAN
PLATE 1



MAGENTA
PLATE 2



YELLOW
PLATE 3



BLACK, THE KEY
PLATE 4



C + M + Y
WITHOUT BLACK, FLAT AND
PALE



ALL FOUR
THE PRINTED PICTURE

YOUR SPOT POSTER WORKS THE SAME WAY, WITH YOUR OWN INKS IN PLACE OF THESE FOUR.
Picture: Wilhelm Hoffmann, Dresden · Kunst-Anstalt für Moderne Plakate · 1895-1900 · Rijksmuseum, CC0. Plates split for this deck.

Some screen colors do not exist in ink.

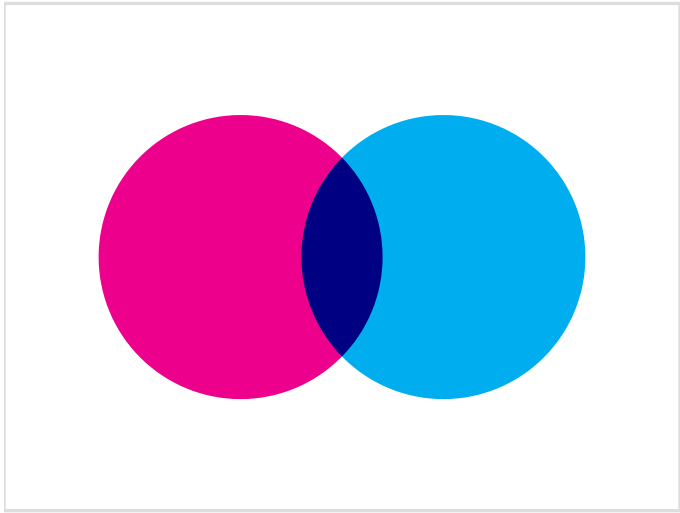
A screen gives off light, while paper can only reflect it. That is why the brightest greens, blues and oranges on your screen cannot be printed with the four inks and come out duller on paper. To see what will happen before you print, turn on `View > Proof Colors` in Illustrator or Photoshop.



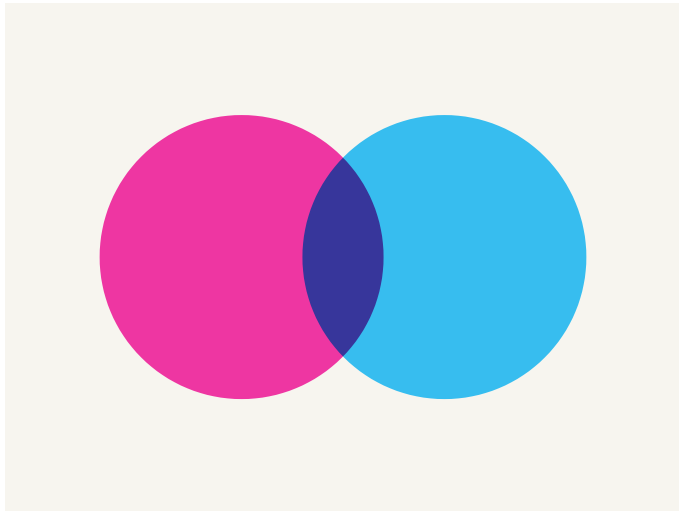
PRINTERS SELL PREMIXED INKS, LIKE FLUORESCENTS AND METALLICS, FOR COLORS THE FOUR INKS CANNOT REACH.

The paper is part of every color.

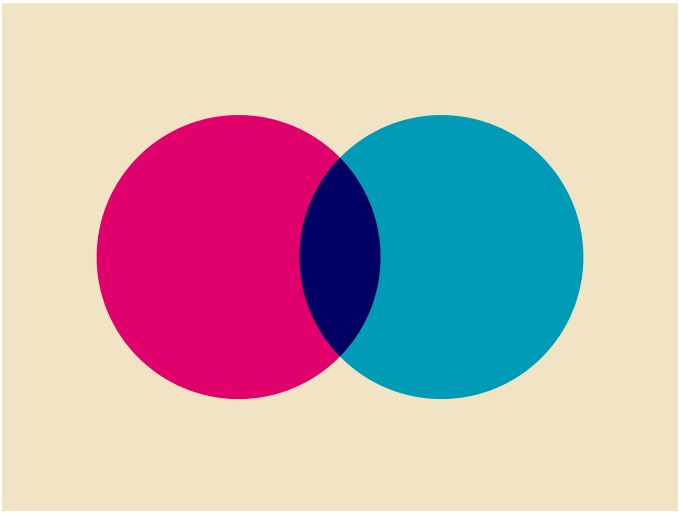
Most ink is see-through, so the paper color shows through it. The same file looks brightest on smooth white paper, softer on rough paper, warmer on cream, and completely different on colored paper.



SMOOTH WHITE PAPER
THE BRIGHTEST IT GETS



ROUGH PAPER
INK SOAKS IN AND LOOKS SOFTER



CREAM
EVERY COLOR LOOKS WARMER



YELLOW PAPER
PINK TURNS RED, CYAN TURNS GREEN

From the office printer back in time

We start with the printer you used this week and work back through copiers, printing presses, photos made of dots, and carved wood blocks.

The laser printer draws with static electricity.

01	Charge. A metal drum gets a charge of static electricity, like a balloon rubbed on your hair.
02	Draw. A laser draws your page onto the drum.
03	Toner. Toner is a very fine colored powder. It only sticks where the laser drew.
04	Transfer. The paper rolls past the drum and picks up the powder.
05	Fuse. Hot rollers melt the powder onto the paper. That is why prints come out warm.
C M Y K	Color. A color laser printer does this four times, with cyan, magenta, yellow and black toner. Each color goes down on its own, one on top of the other.



FOUR TONERS, FOUR COLORS
Raimond Spekking · Xerox Phaser 6600 toner cartridges in black, yellow, cyan, and magenta · 2021 · Raimond Spekking, CC BY-SA 4.0, via Wikimedia Commons

It started as a copier.



1938 · ASTORIA, QUEENS
CHESTER CARLSON'S FIRST COPY
Chester Carlson and Otto Kornei · First xerographic copy, '10.-22.-38 ASTORIA' · 1938 · Xerox Corporation; non-free, used under fair use for teaching (English Wikipedia)



1959 · XEROX 914
THE FIRST OFFICE COPIER
Xerox Corporation · Xerox 914 copier · 1959 · Xerox Corporation press photo; non-free, used under fair use for teaching (English Wikipedia)



1984 · HP LASERJET
THE FIRST DESKTOP LASER PRINTER
Hewlett-Packard (photo: Atomic Taco) · HP LaserJet (original) · 1984 · Atomic Taco, CC BY-SA 2.0, via Wikimedia Commons

1938	Chester Carlson, an office worker, makes the first copy using static electricity and powder, in a rented room in Queens. His invention becomes the Xerox copier.
1969 to 1971	Gary Starkweather at Xerox hooks a copier up to a computer and a laser. It prints straight from the computer: the first laser printer.

Printers · inkjet

Inkjet sprays the dots instead.

Tiny nozzles spray drops of cyan, magenta, yellow and black. Bigger art printers add extra inks for smoother color. A high-quality inkjet print on long-lasting paper is called a giclée (zhee-CLAY). Most illustrators sell their art prints this way, from one finished file.



A WIDE-FORMAT ART PRINTER

Siddharthchoudharystudio · Artist-Siddharth-Choudharys-studio · 2019
· Siddharthchoudharystudio, CC BY-SA 4.0, via Wikimedia Commons



CMYK INKJET

Kenny Louie · Ink-jet cartridges · 2009 · Kenny Louie, CC BY 2.0,
via Wikimedia Commons

Before toner: plates, ink and dots.

1796

LITHOGRAPHY

Alois Senefelder draws on a flat stone with a greasy crayon. He wets the stone, and oily ink sticks only to the drawing, because oil and water do not mix.

1880s

PHOTOS AS DOTS

A photo is broken into tiny dots: big dots for dark areas, small dots for light ones. Now newspapers can print photographs.

1904

OFFSET

Offset printing begins, on big presses that print from metal plates. Most books, magazines and boxes are still printed this way.

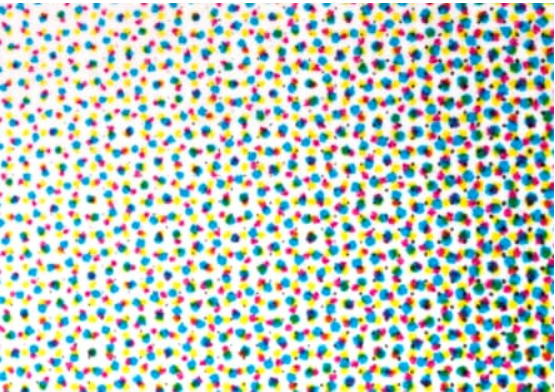
Early 1900s

FULL COLOR

Four plates of dots, one each for cyan, magenta, yellow and black, print full-color pictures. Your laser printer does the same thing on a small scale.



A FOUR-COLOR OFFSET PRESS
ONE UNIT PER INK
Rémi · Heidelberg Speedmaster Press IGN · 2010 · Rémi, CC BY-SA 3.0, via Wikimedia Commons



CMYK DOTS, MAGNIFIED
THE ROSETTE
Nico Hähnlein · Postscript-Druckraster · 2014 · Nico Hähnlein, copyrighted free use, via Wikimedia Commons

Printers · before dots

Before dots, every color was its own block.

Japanese woodblock printers carved a separate block for every color. Color posters in the 1800s used a separate stone for every color. Each ink was mixed to the exact color first and printed solid. Today we call that a spot color.



WOODBLOCK

ONE CARVED BLOCK PER COLOR

Utagawa Hiroshige · Sudden Shower over Shin-Ohashi Bridge and Atake · 1857 · Public domain



COLOR LITHOGRAPH

ONE STONE PER COLOR

Wilhelm Hoffmann, Dresden · Kunst-Anstalt für Moderne Plakate (Les Maîtres de l'Affiche) · 1895-1900
· Rijksmuseum, CC0, via Wikimedia Commons

Printers · made by the scene

Made cheaply, by the scene itself.

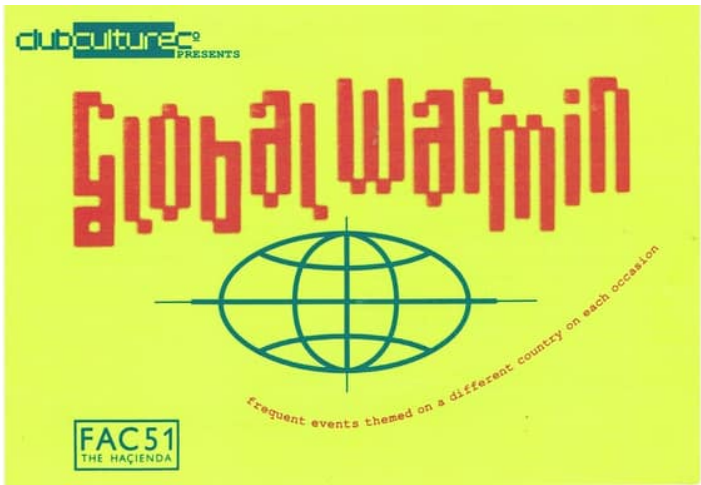
In the late 1980s and the 1990s, dance parties in the UK and the US were advertised on small flyers, made by the promoters and their friends. Most were run as cheaply as possible: photocopied onto colored or fluorescent paper, screenprinted in a garage, or printed in one or two colors at the local copy shop. A lot of the color you see is the paper.



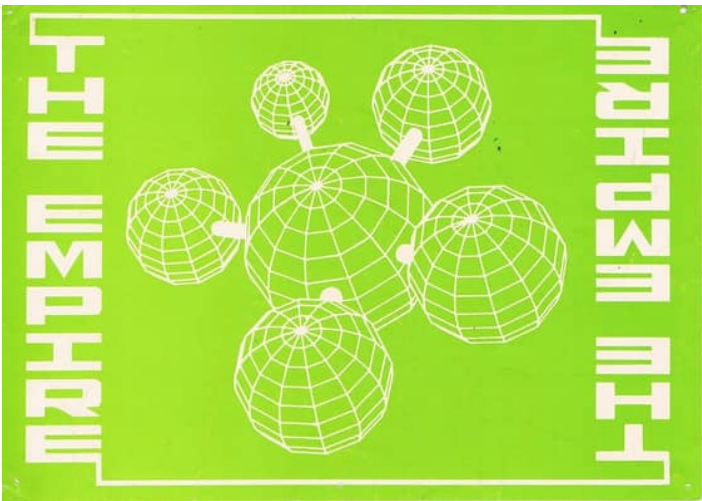
GREEN, ORANGE, BLACK LINES
Phato / Solarize, Syracuse · 1990s · Workhorse reference collection



FLUORESCENT YELLOW BACKGROUND, RED, PURPLE
Void · 1991 · Workhorse reference collection



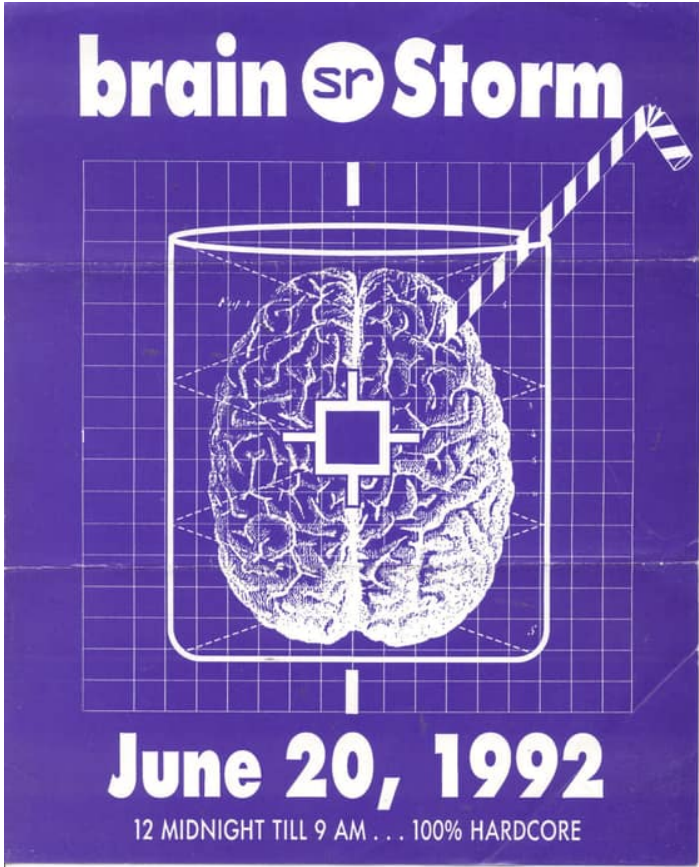
FLUORESCENT YELLOW BACKGROUND, RED, GREEN
Global Warmin (clubculture presents) · 1990s · Workhorse reference collection



GREEN BACKGROUND, WHITE LINES
The Empire · 1990s · Workhorse reference collection

Printers · made by the scene

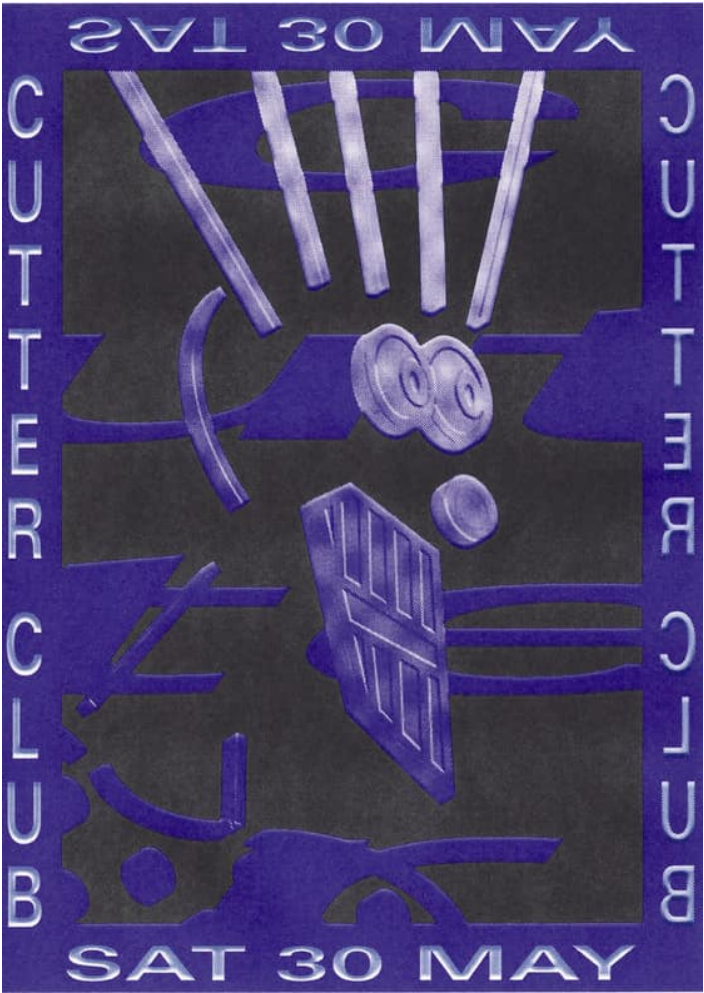
Small flyers, loud color.



PURPLE AND WHITE
brainStorm · 1992 · Workhorse reference collection



BLACK, ORANGE, GREEN BANDS
Electric Kingdom "The Fourth Dimension" · 1990s · Workhorse reference collection



FLUORESCENT YELLOW, VIOLET, BLACK
Cutter Club, Sat 30 May · 1990s · Workhorse reference collection



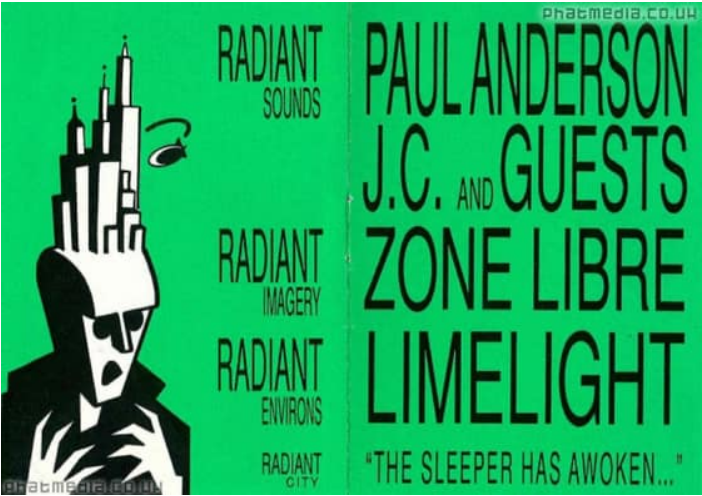
TWO COLORS AND A COARSE DOT PATTERN
Essential · 1990s · Workhorse reference collection

A FLYER HAS TO WORK IN A HAND, IN A STACK ON A COUNTER, AND PINNED TO A WALL. SO DOES YOUR POSTER.

Printers · paper or ink

Find the white.

A copier only prints black, so a cheap flyer got its color from the paper. If you can find white anywhere on a flyer, the paper is white, and every color on it is ink.



NO WHITE ANYWHERE

GREEN PAPER, BLACK INK

Radiant, Zone Libre at Limelight · early 1990s · Workhorse reference collection



WHITE EVERYWHERE

WHITE PAPER, ONE BLACK INK

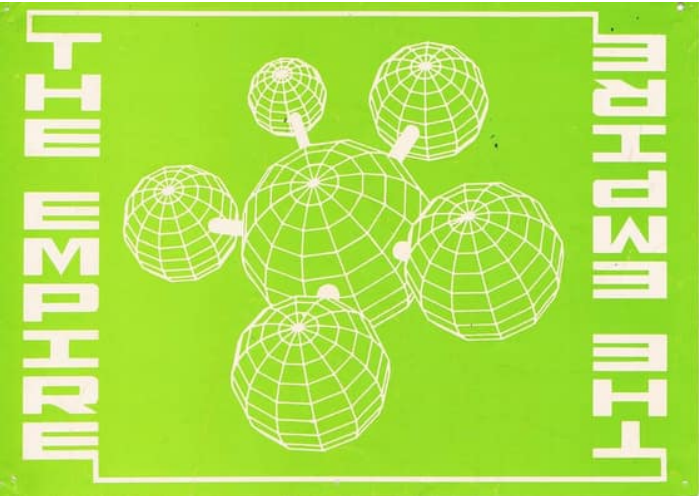
Hedonism · 26 Feb 1988 · Workhorse reference collection



WHITE BETWEEN THE COLORS

WHITE PAPER, THREE INKS

Pyramid · 20 May 1989 · Workhorse reference collection



WHITE LETTERS

GREEN INK. THE LETTERS ARE BARE PAPER.

The Empire · 1990s · Workhorse reference collection

TRY IT ON YOUR OWN POSTER: WHERE IS THE PAPER SHOWING?

There are two ways to make color in print, and many jobs use both.

	FOUR-COLOR (CMYK)	SPOT COLOR
The idea HOW COLOR IS MADE	Make any color out of dots of four inks.	Mix the exact color first, then print it solid.
Where it came from THE HISTORY	Photos made of dots, and big printing presses.	Woodblocks and stone printing.
Where you see it now TODAY	Laser, inkjet, magazines, photos.	Screenprint, riso, letterpress, brand colors, metallics.
Your poster PROJECT 2	Allowed. The brief lets you go full color if you set it up for CMYK. Your separations are then four pages: C, M, Y and K.	Three colors plus the line. This is the main route in the brief, and the rest of today shows how to set it up.

Risograph

A Japanese copy machine from 1980, made for schools and offices, that artists fell in love with. It works a lot like a small, automatic screenprint.

A stencil, a drum, and one color at a time.

01	Stencil. The machine burns thousands of tiny holes into a thin sheet, the stencil, wherever your page is dark.
02	Drum. The stencil wraps around a drum full of ink. Each color has its own drum.
03	Print. The drum spins and pushes ink through the holes onto the paper. It is fast and cheap, at more than a hundred copies a minute.
04	Next color. Swap in the next drum, make a new stencil, and run the paper through again. The colors never line up perfectly.
Ink	Riso ink is made from soy and is see-through. It comes in about twenty colors, including a well-known fluorescent pink. Where two colors overlap, they make a third.



SWAPPING THE DRUM
Yoleeth · Riso-drum-swap · 2025 · Yoleeth, CC BY-SA 4.0, via Wikimedia Commons



TWO COLORS, UP CLOSE
Mario Felipe · Two-color risograph print, A3 · 2014 · Mario Felipe, CC BY 2.0, via Wikimedia Commons

Risograph · where it came from

From the church office to the art fair.

1880s

THE MIMEOGRAPH

Thomas Edison and A.B. Dick sell the mimeograph: you write on a waxed sheet, and ink pushes through where you wrote. Schools, churches and organizers print newsletters on them for a hundred years.

1980

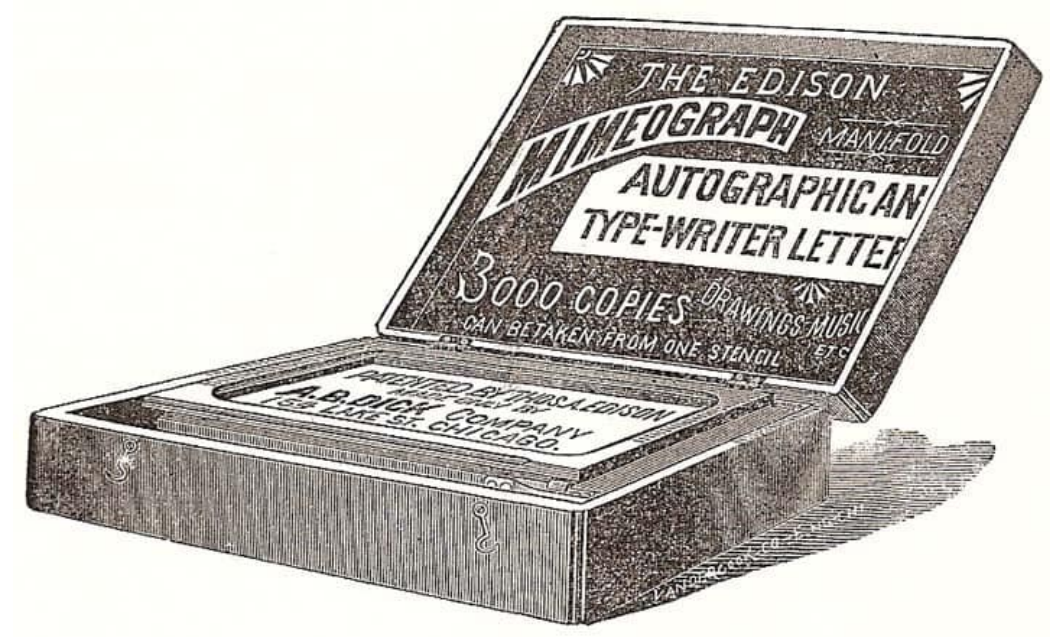
RISO KAGAKU, TOKYO

Noboru Hayama's company sells the first Risograph, an automatic mimeograph for schools, offices and churches.

2000s

ARTISTS

Offices switch to laser printers. Artists buy the old risos cheap for zines and prints. They love the bright ink, the flat color, and the colors not quite lining up.



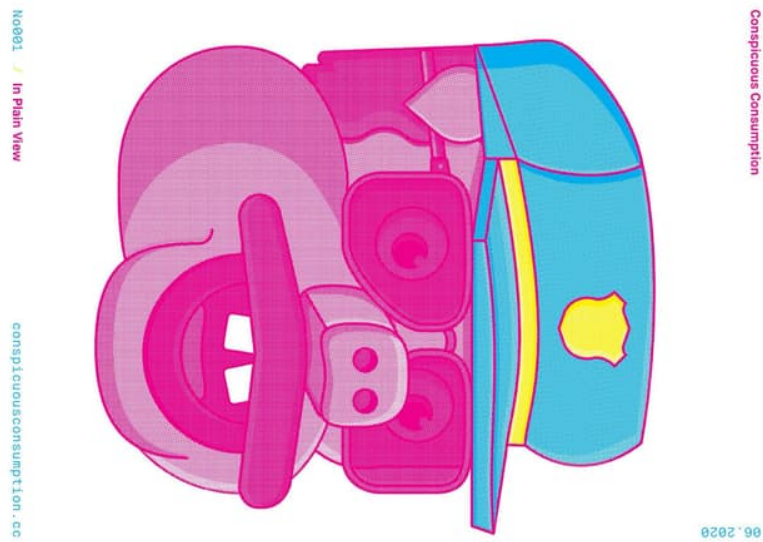
A MIMEOGRAPH

A.B. Dick Company · The Edison Mimeograph, advertisement · 1889 · Public domain, via Wikimedia Commons

Risograph · a zine

In Plain View, a zine, 2020.

A protest zine from the summer of 2020. Photos and screenshots were turned into dot patterns in Photoshop, with one file for each ink: magenta, cyan and yellow. Look where the colors overlap and where they miss.



THE CENTERFOLD
THREE INKS, OVERPRINTING



ONE INK'S FILE
ALL DOTS



AT 100%
THE DOTS ARE THE IMAGE

TO MAKE DOTS IN PHOTOSHOP: IMAGE > MODE > GRAYSCALE, THEN IMAGE > MODE > BITMAP > HALFTONE SCREEN.

Flyers and zines

A zine is a magazine you make yourself.

Zines are cut, pasted, photocopied, folded and stapled, then sold or traded at shows and record stores, with no publisher and no one's permission. Music scenes, politics and art movements used zines to talk to each other before the internet.

How they print

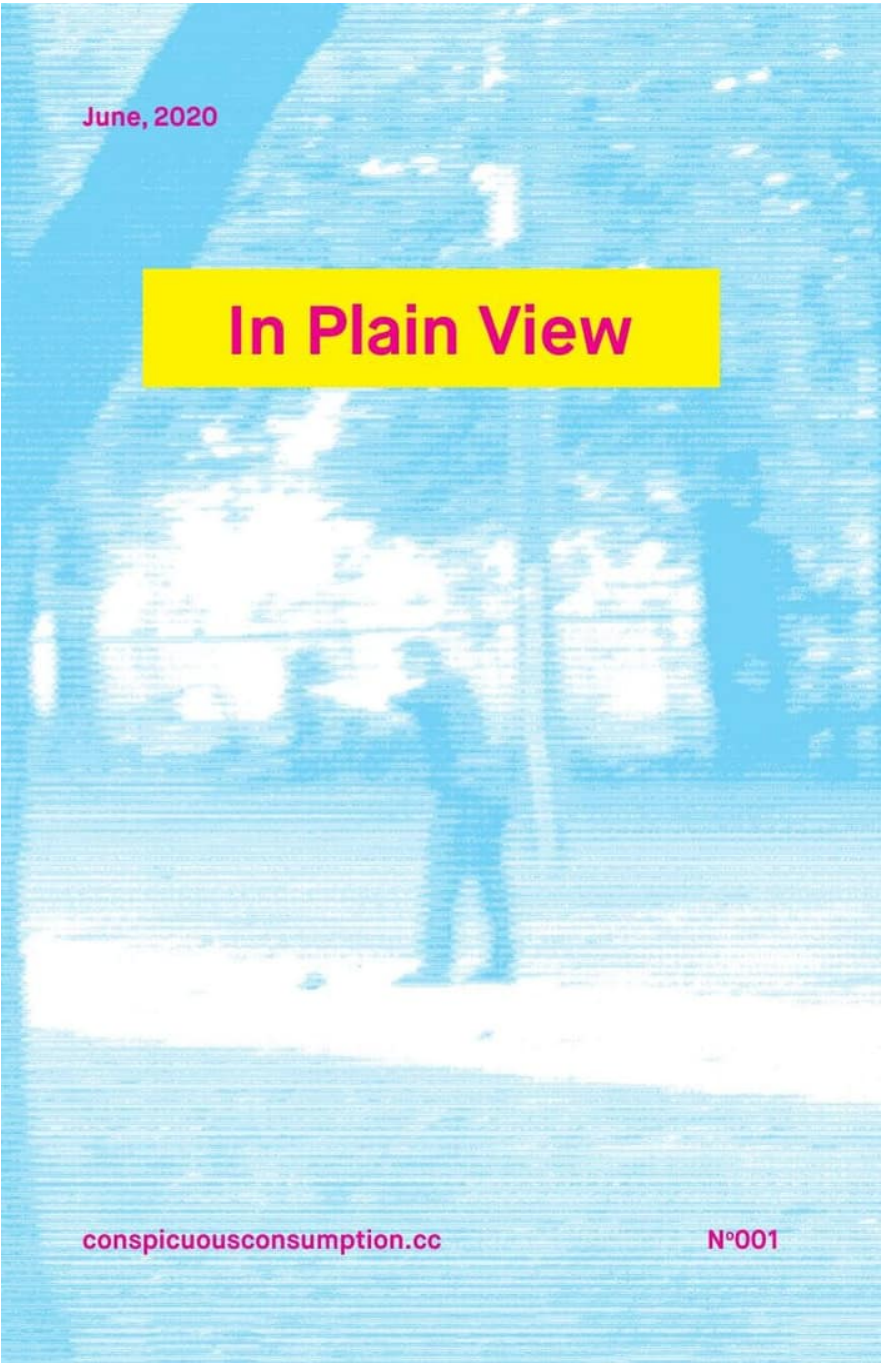
THE CONSTRAINT

A copier prints only black, so the color came from the paper: cheap, bright copy paper bought by the ream. Photos were turned into big dots so the copier could print them.

Why it matters here

FOR AN ILLUSTRATOR

The rough black line and the few flat colors came out of these limits. Plenty of illustrators got their start making zines.



One ink, sixty-four pages.

As Seen On The Streets is a zine series of photos of graffiti, tags, stickers and wheat pastes. The Baltimore issue is black only, start to finish. The grays in the photos are tiny black dots, and the white paper does the rest.



THE COVER
WHITE TYPE ON BLACK
Cheer Up Official · As Seen On The Streets:
Baltimore-01 · 5.5 × 8.5 in, 64 pages, black and
white throughout, numbered edition of 50 ·
cheerupofficial.com



PHOTOS IN BLACK
EVERY GRAY IS BLACK INK
Cheer Up Official · As Seen On The Streets:
Baltimore-01 · photos from late 2019 and early
2020



FULL BLEED
PHOTOS RUN OFF THE PAGE
Cheer Up Official · As Seen On The Streets:
Baltimore-01



A GRID OF PHOTOS
SAME INK, DIFFERENT LAYOUT
Cheer Up Official · As Seen On The Streets:
Baltimore-01

A city's scene, told through its paper.

Up from the People, the permanent exhibition on protest and change in Washington, DC, at the Martin Luther King Jr. Memorial Library. Workhorse designed its brand and graphics. One wall is punk and DIY culture: flyers, calendars, a rack of zines.



THE PUNK AND DIY WALL
MLK MEMORIAL LIBRARY, 2020



DC SPACE CALENDAR
JUNE 1989

d.c. space calendar, June 1989 · 1989 · DC Public Library, *Up from the People* exhibition (2020); exhibition design by Workhorse; archival handbill



9:30 CLUB
A VENUE POSTCARD

9:30 Club April calendar postcard · 1980s · DC Public Library, *Up from the People* exhibition (2020); exhibition design by Workhorse; archival handbill

Globe Poster: made to be read from a moving car.

Globe Poster Printing in Baltimore made show posters for eighty years, and printed the go-go posters that covered DC. A Globe poster had to be read in seconds, from a car going forty miles an hour.

1929 BALTIMORE	Globe opens and prints posters for carnivals, fairs, boxing and movies.
1950s DAY-GLO	Designer Harry Knorr puts big black type over bands of fluorescent color. That becomes the Globe look.
1975 on GO-GO	Joe Cicero, a longtime worker, buys the shop. He and his sons print posters for Chuck Brown, Trouble Funk, Rare Essence and E.U.
2010 CLOSED	MICA, the art school in Baltimore, takes the wood type and the presses, and still prints with them.



TROUBLE FUNK, ATLAS DISCO, 1985
Globe Poster Corp. · Trouble Funk, Static Disruptors and
Hot, Cold Sweat · March 5, 1985 · DC Public Library, Dig
DC, Globe Performance Poster Collection; in copyright, used
for teaching

Same black type, new color underneath.

Globe printed each poster in two steps. First the bright color bands were screenprinted. Then the black words were printed on top from wood and metal type. Globe kept the type and reused it, so a new show only needed a new color layer and a few new words.



MASONIC TEMPLE · 1975
HOT PINK AND BLACK

Globe Poster Corp. · Chuck Brown and the Soul Searchers with Dollar Bill, Masonic Temple · Sept 24, 1975 · DC Public Library, Dig DC; in copyright, used for teaching



WATERSIDE MALL · MARCH 9, 1986
YELLOW AND BLACK

Globe Poster Corp. · Chuck Brown and the Soul Searchers, R.S.V.P. Nite Club, Waterside Mall · March 9, 1986 · DC Public Library, Dig DC; in copyright, used for teaching



MASONIC TEMPLE · MARCH 22, 1986
PINK AND BLACK

Globe Poster Corp. · Chuck Brown and the Soul Searchers, Hustler's Ball, Masonic Temple · March 22, 1986 · DC Public Library, Dig DC; in copyright, used for teaching

YOUR POSTER PRINTS IN THE SAME ORDER: COLOR FIRST, THEN THE BLACK LINE ON TOP.



GLOBE POSTER PRINTING CORP., 3705 BANK STREET, BALTIMORE, MD. 21224, (410) 685-8787 • 2000

WORKHORSE

GLOBE POSTER • BALTIMORE
GO-GO SHOW POSTERS

COUNT THE INKS

Bright bands first, black type on top

From the exhibition files for *Up from the People*. On screen: Globe Poster Printing Corp., Baltimore. Chuck Brown, Trouble Funk and E.U., 9:30 Club. Chuck Brown and the Soul Searchers, Celebrity Hall. Chuck Brown and the Soul Searchers, Panorama Room. Gerald's All Girls Show. Save the Go-Go! rally, District Building, July 10, 1987. Mass Extinction, MJ's Meeting Place, April 30, 2005. Scanned for Up from the People, DC Public Library, 2020; exhibition design by Workhorse.

For each one: how many inks? Find where the paper shows through, and where black sits on top of a color.

HERE WE GO AGAIN!
EVERY SATURDAY NIGHT AT...
CELEBRITY HALL
3401 GEORGIA AVENUE & PARK ROAD, N. W.

A. K. A. THE BLACK HOLE

Every **SATURDAY**
Starts **SATURDAY, APR. 5**
10:30 P.M. 'til 3:00 A.M. * * ADMISSION \$8.00
★ **722-0994** ★

D. C.'s No. 1 BAND

CHUCK BROWN

AND THE



SOUL
SEARCHERS

"I NEED
SOME
MONEY"

New Release.. "HERE WE GO AGAIN"
"BUSTIN' LOOSE"

SAY NO TO DRUGS and JUVENILE DELINQUENCY
BE CAREFUL OF OUR NEIGHBORHOOD!!

NO INS & OUTS * * NO REFUNDS

GLOBE POSTER 1801 Byrd Street • Baltimore, Md. 21230 • Phone (301) 685-8787

WORKHORSE

GLOBE POSTER • BALTIMORE

GO-GO SHOW POSTERS

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For each one: how many inks? Find where the paper shows through, and where black sits on top of a color.

EVERY TUESDAY NIGHT
A - G O - G O

PANORAMA ROOM
1600 MORRIS ROAD, S.E.--WASHINGTON, D. C.

Every

TUESDAY

10:00 P.M. 'til 3:00 A.M. -- Limited Admission \$6.00

★ 722-0994 ★

Featuring... D. C.'s No. 1 BAND

CHUCK BROWN
AND THE



Soul
SEARCHERS

REMINISCING FROM...
"BUSTIN' LOOSE" to "I NEED SOME MONEY"

NO INS & OUTS ★ NO REFUNDS

1801 Byrd Street • Baltimore, Md. 21230 • Phone (301) 685-8787

WORKHORSE

GLOBE POSTER • BALTIMORE

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For each one: how many inks? Find where the paper shows through, and where black sits on top of a color.

JUST US PRODUCTIONS Presents

All Girls Show

GERALD'S

– Formerly TRIPLES –

3714 BRANCH AVENUE ★ HILLCREST HEIGHTS, MD.

THUR. SEPT. 13

9:00 P.M. 'til 3:00 A.M.

ADMISSION \$10.00 Before 11 P.M. • \$12.00 After

Featuring

PRECISE

Former Members of PLEASURE

ROYALTY ♦ DELICIOUS

KLYXX ♦ GENUINE

LOCKET DOWN QUEEN

Photos by CAMERAMAN DAVE

NO IN's & OUT's ♦ NO REFUNDS

GLOBE POSTER PRINTING CORP., 1801 BYRD STREET, BALTIMORE, MD. 21230, (301) 685-8787 • 1990

WORKHORSE

GLOBE POSTER • BALTIMORE

GO-GO SHOW POSTERS

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WORKHORSE

GLOBE POSTER · BALTIMORE

GO-GO SHOW POSTERS

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\$100.00
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for
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Live!
In Person!

MASS EXTINCTION

MJ's MEETING PLACE

1442 ADDISON RD. • CAPITOL HEIGHTS, MD
WALKER MILL SHOPPING CENTER

SAT. APR. 30

2005

4:00P.M.
'til 8:00P.M.

ADMISSION \$12.00
FOR KIDS & TEENS



ADMISSION \$10.00
FOR ADULTS

FOR INFO.
CALL:

202-413-0996 • 202-497-5217

GLOBE POSTER PRINTING CO • 3705 BANK STREET • BALTIMORE, MD. 21224 • 410-563-3800 • 2005

WORKHORSE

GLOBE POSTER • BALTIMORE

GO-GO SHOW POSTERS

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Go-go handbills: two inks and a lot of type.

Go-go, DC's own music, advertised its shows on cheap flyers in bright ink on white or colored paper. The exhibition's graphics borrowed that look, with dotted photos in orange and black on cream paper, like a two-color print.



RARE ESSENCE

BLUE AND BLACK ON WHITE

Rare Essence at Cheriy's handbill · DC Public Library, Up from the People exhibition (2020); exhibition design by Workhorse; archival handbill



CHUCK BROWN

HANDBILL

Chuck Brown and the Soul Searchers, Panorama Room · DC Public Library, Up from the People exhibition (2020); exhibition design by Workhorse; archival handbill



UP FROM THE PEOPLE

ORANGE AND BLACK HALFTONE



UP FROM THE PEOPLE

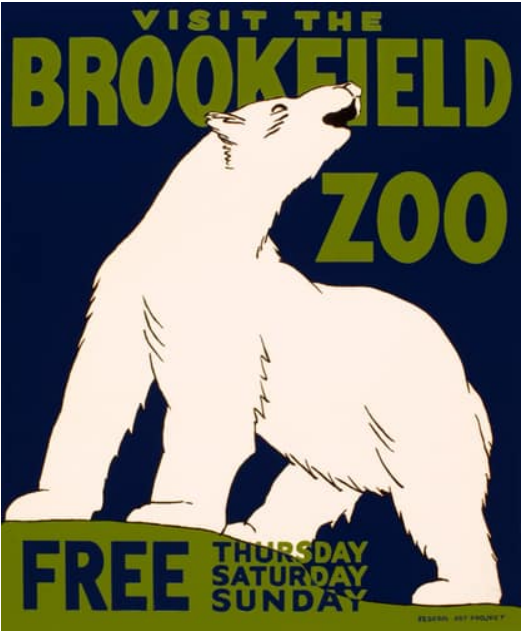
CREAM STOCK AS THE THIRD COLOR

Screenprint

Screenprinting works like the riso, but by hand: ink is pushed through a screen, one color at a time. Your poster is set up to be printed this way.

Screenprint started as a stencil.

Centuries CHINA, JAPAN	Printers use paper stencils, held together with silk threads or hair, to print patterns on cloth.
1907 MANCHESTER	Samuel Simon patents printing through silk stretched on a wooden frame. Sign makers start using it.
1930s THE WPA	During the Depression, a US government art program hires artists to make thousands of screenprinted posters: flat colors, bold shapes, only a few inks.
1960s ART	Corita Kent in Los Angeles and Andy Warhol in New York make screenprints into art for galleries.
Now GIG POSTERS	Concert posters, art prints and T-shirts, usually fifty to a few hundred at a time.



WPA SILKSCREEN
WPA Federal Art Project · Visit the Brookfield Zoo · 1936 · Library of Congress WPA Poster Collection, via Wikimedia Commons, no known restrictions



WPA SILKSCREEN
WPA Federal Art Project · See America: Welcome to Montana · 1937 · Library of Congress WPA Poster Collection, via Wikimedia Commons, no known restrictions

From your separation to a print.

- 01

Film. Each color of your poster is printed in black on a clear plastic sheet. That is why each separation has to be solid black.
- 02

Expose. The screen is coated with a goo that hardens in light. It goes under the plastic sheet and a bright lamp. Where your art is black, the light is blocked and the goo stays soft.
- 03

Wash out. The soft goo washes off with water, leaving open holes in the exact shape of your art.
- 04

Pull. Ink goes on the screen. One pull of a rubber blade, the squeegee, pushes ink through the holes onto the paper.
- 05

Next color. Let it dry. Line up the next screen using the target marks, and print the next color. Repeat for every color.



THE SCREEN, EXPOSED
Hickman Design · Washing out exposed screen printing emulsion 03 · 2019 ·
Hickman Design, CC BY-SA 4.0, via Wikimedia Commons



THE PULL
Ahmad Ali Karim · Screen printing demonstration at TEDxUTM · 2025 · Ahmad Ali
Karim, CC0, via Wikimedia Commons

How color behaves on a screen.

See-through or solid

THE PRINTER'S CHOICE

See-through ink mixes where colors overlap and makes new colors. Solid ink covers whatever is under it. That is how you print white on black paper.

Big dots

YOU CAN SEE THEM

A screen cannot print tiny dots, so light shades and soft blends come out as visible dots. Many printers like that look. Ask before you use soft gradients.

Thin lines break

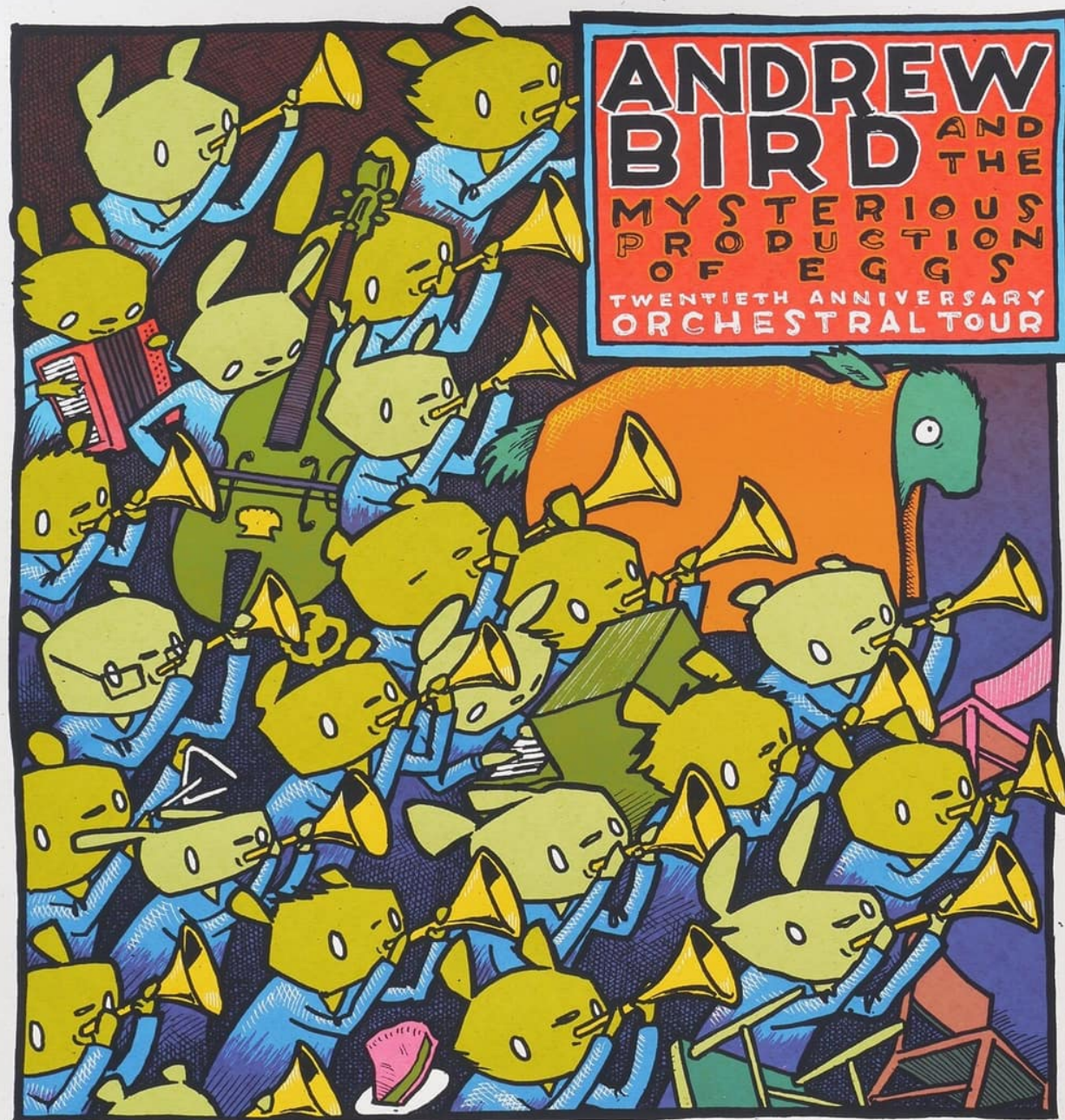
FROM SESSION 9

Very thin lines and tiny gaps fill in or disappear. Your drawn line at 18 by 24 inches is fine. Very fine texture is not.

Colors miss a little

PART OF THE LOOK

Each color lands slightly off. Good screenprint designs plan for this by letting colors overlap instead of meeting exactly.



FEB 28 · LONDON · UK
 APR 2 · WATERBURY · CT
 APR 4 · PROVIDENCE · RI
 APR 7 · BUFFALO · NY
 APR 9 · INDIANAPOLIS · IN
 MAY 29 · ASHEVILLE · NC
 MAY 31 · GREENSBORO · NC
 JUNE 3 · NORTH BETHESDA · MD
 JUNE 4 · NORTH BETHESDA · MD
 AUG 1 · SAN FRANCISCO · CA

20
 26

CINCINNATI · OH · AUG 4
 NEW YORK · NY · AUG 6
 LOS ANGELES · CA · OCT 23
 MEXICO CITY · MX · OCT 27
 MEXICO CITY · MX · OCT 28
 MILWAUKEE · WI · NOV 10
 CHICAGO · IL · NOV 13
 CHICAGO · IL · NOV 14
 DETROIT · MI · NOV 17
 MINNEAPOLIS · MN · NOV 21

WORKHORSE

JAY RYAN · THE BIRD MACHINE
 CHICAGO · GIG POSTERS

COUNT THE INKS

Drawn by hand, separated by hand, pulled by hand

Show posters, screenprinted in small editions. On screen: Jay Ryan / The Bird Machine, Andrew Bird 'Eggs' Orchestral Tour, 2026. Jay Ryan / The Bird Machine, The Breeders with Team Dresch, Woodland Park Zoo, Seattle, Aug 20, 2026. Jay Ryan / The Bird Machine, Wilco with Yo La Tengo, Forest Hills Stadium, New York, June 20, 2026.

For each one: how many inks? Which colors are real inks, and which come from two inks overlapping?



WORKHORSE

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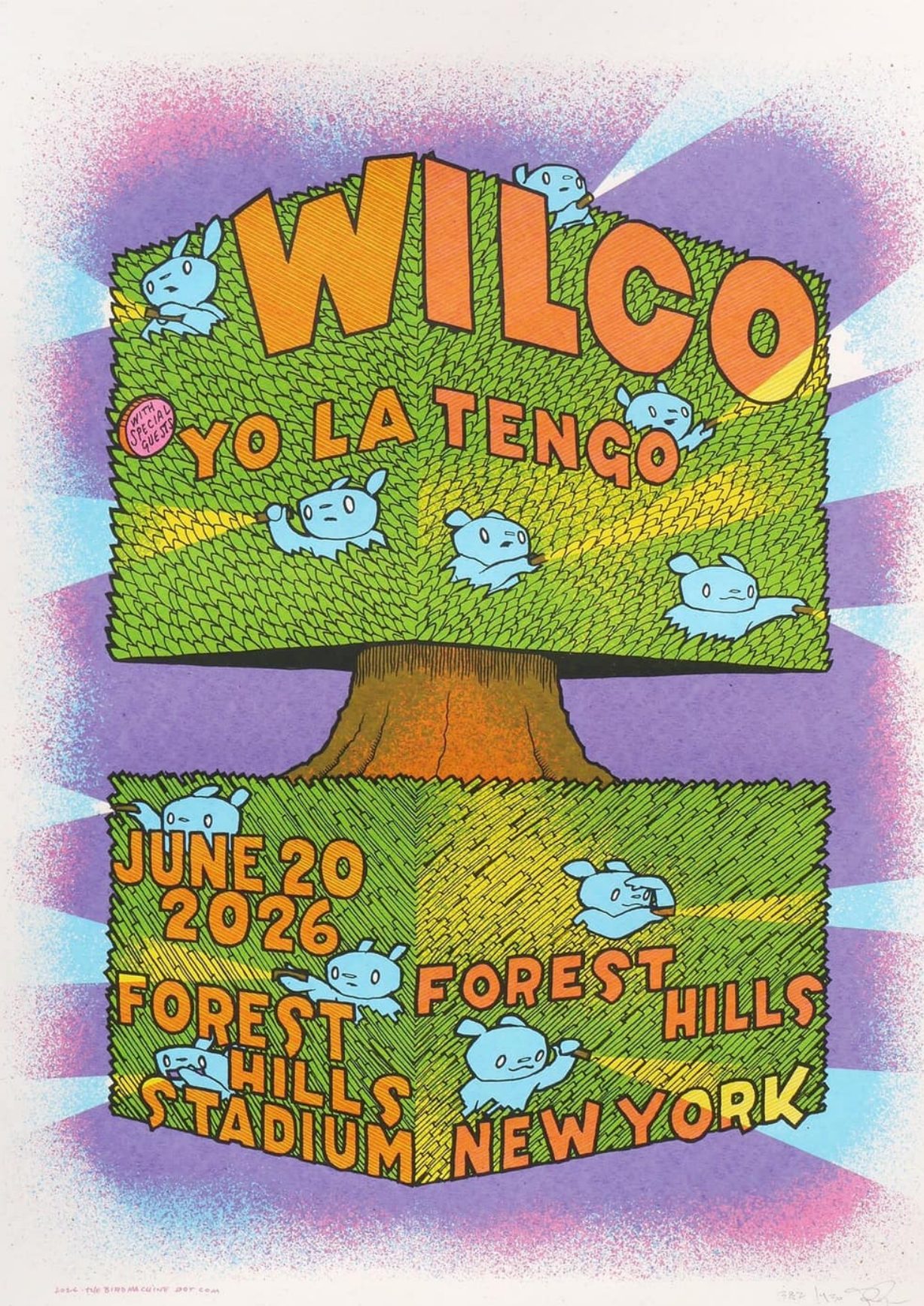
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JAY RYAN · THE BIRD MACHINE
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For each one: how many inks? Which colors are real inks, and which come from two inks overlapping?



WORKHORSE

ROCKETS ARE RED

SCREENPRINTS · 18 × 24

COUNT THE INKS

Same drawing, different inks

Art prints, three and four colors. On screen:

Rockets Are Red, Car Kiss (Red) and Car Kiss (Mist), three-color screenprints. Rockets Are Red, Post Meridan, three-color screenprint. Rockets Are Red, Jawbreaker 2025, four-color screenprint, and its glow-in-the-dark version. All 18 × 24, rocketsarered.bigcartel.com.

The two Car Kiss prints use the same drawing. What changed between them? Then count the inks on each.



WORKHORSE

ROCKETS ARE RED

SCREENPRINTS · 18 × 24

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Red, Jawbreaker 2025, four-color screenprint, and

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rocketsarered.bigcartel.com.

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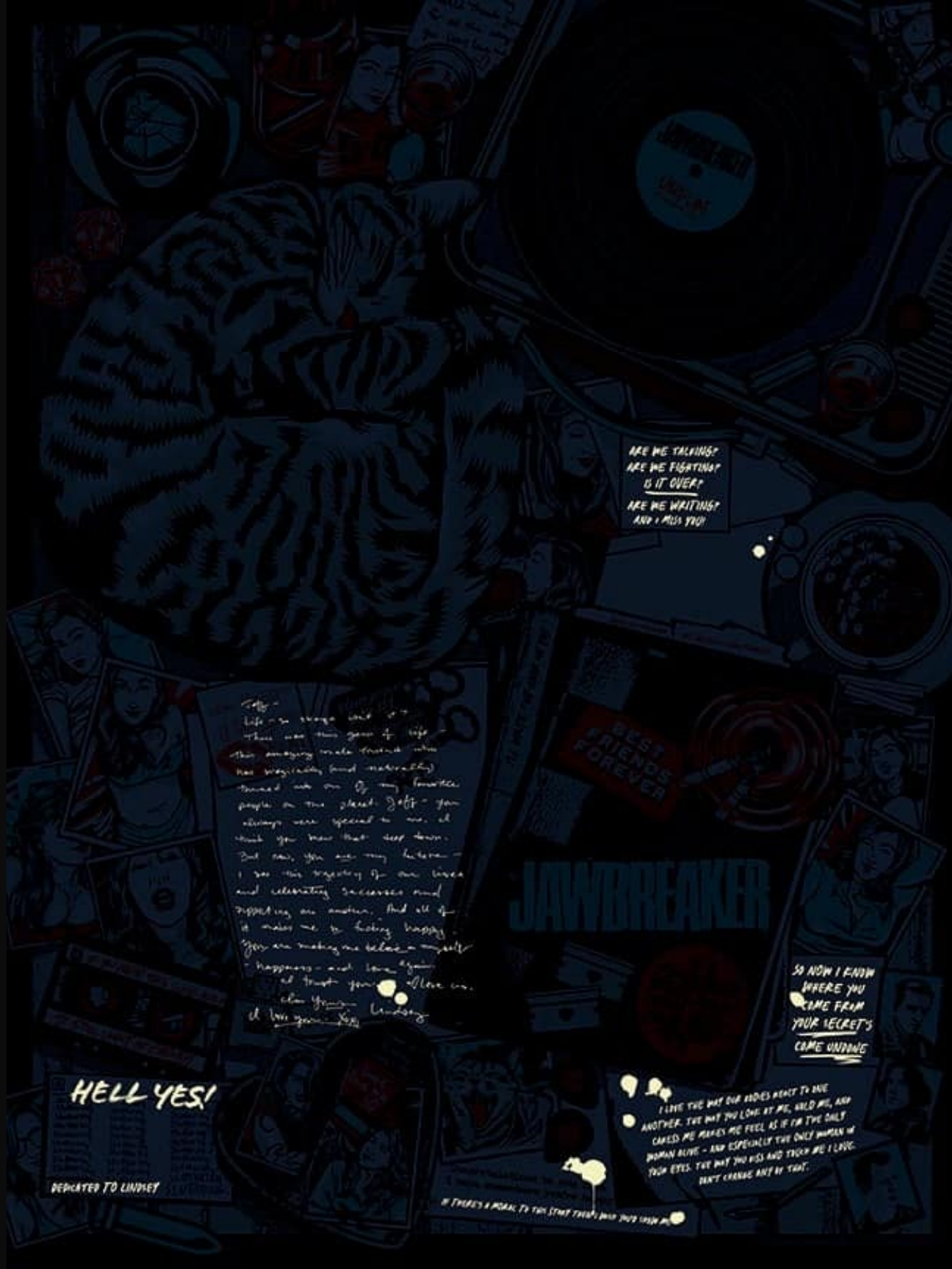
Jawbreaker 2025, four-color screenprint, and

its glow-in-the-dark version. All 18 × 24,

rocketsarered.bigcartel.com.

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**WORKHORSE**

ROCKETS ARE RED

SCREENPRINTS · 18 × 24

COUNT THE INKS

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The two Car Kiss prints use the same drawing.

What changed between them? Then count the

inks on each.

Recap · every method

Seven ways to print, and the file each one wants.

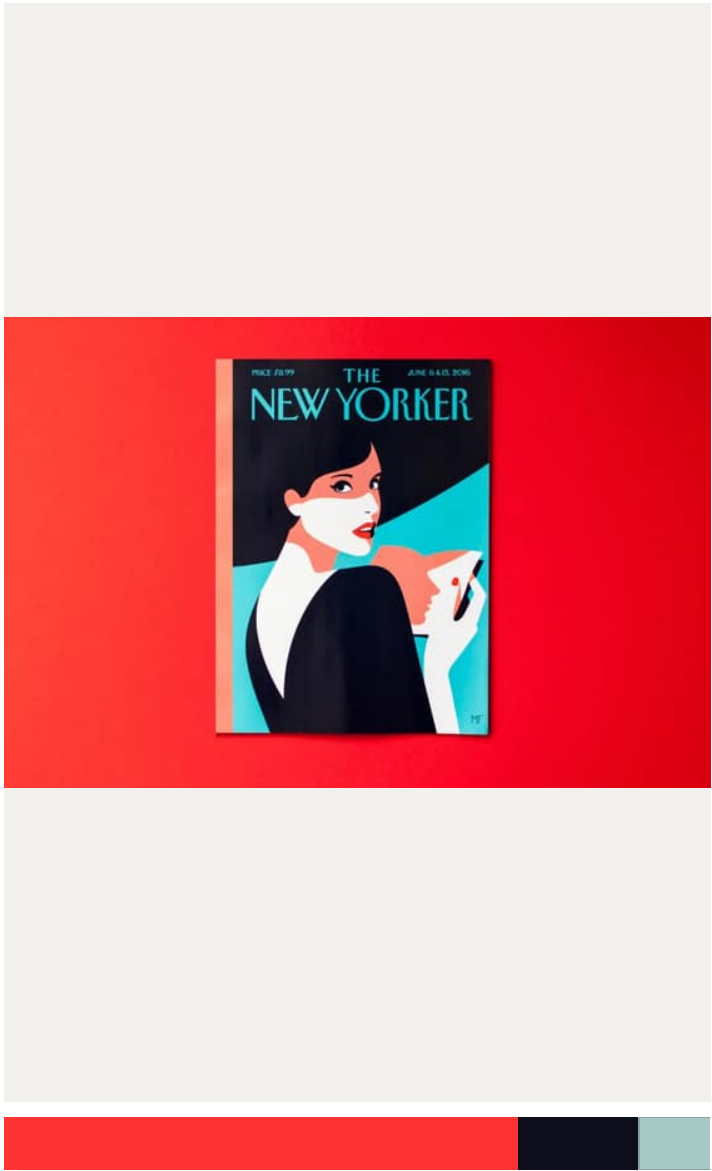
METHOD	HOW COLOR WORKS	WHERE YOU SEE IT	THE FILE IT WANTS
Screenprint INK THROUGH A SCREEN	One screen per ink, solid or see-through, lined up by hand.	Gig posters, art prints, T-shirts	One black page per ink, with target marks. These are your separations.
Risograph A STENCIL COPIER	One drum per color, with about 20 colors to pick from. The ink is see-through and never lines up perfectly.	Zines, art prints, small runs	One black and white page per color. Same as your separations.
Photocopy TONER	Black toner, sometimes one other color. The paper color does the rest.	Zines, flyers, show bills	A black and white original at size.
Letterpress PRESSED	Raised letters or plates pressed into the paper, one color at a time.	Cards, prints, invitations	One solid black file per color. No light shades.
Lino and woodcut CARVED BY HAND	Hand-carved blocks, one per color.	Art prints, posters	A drawing, flipped. No file needed.
Giclée ART INKJET	8 to 12 inks that can print almost anything.	Art print editions, shops	One finished, full-color file at full size.
Digital LASER, INDIGO	Four-color toner, like the office printer.	Flyers, short runs, proofs	A CMYK PDF, with 1/8 inch extra past the edges.

One or two inks, plus the paper

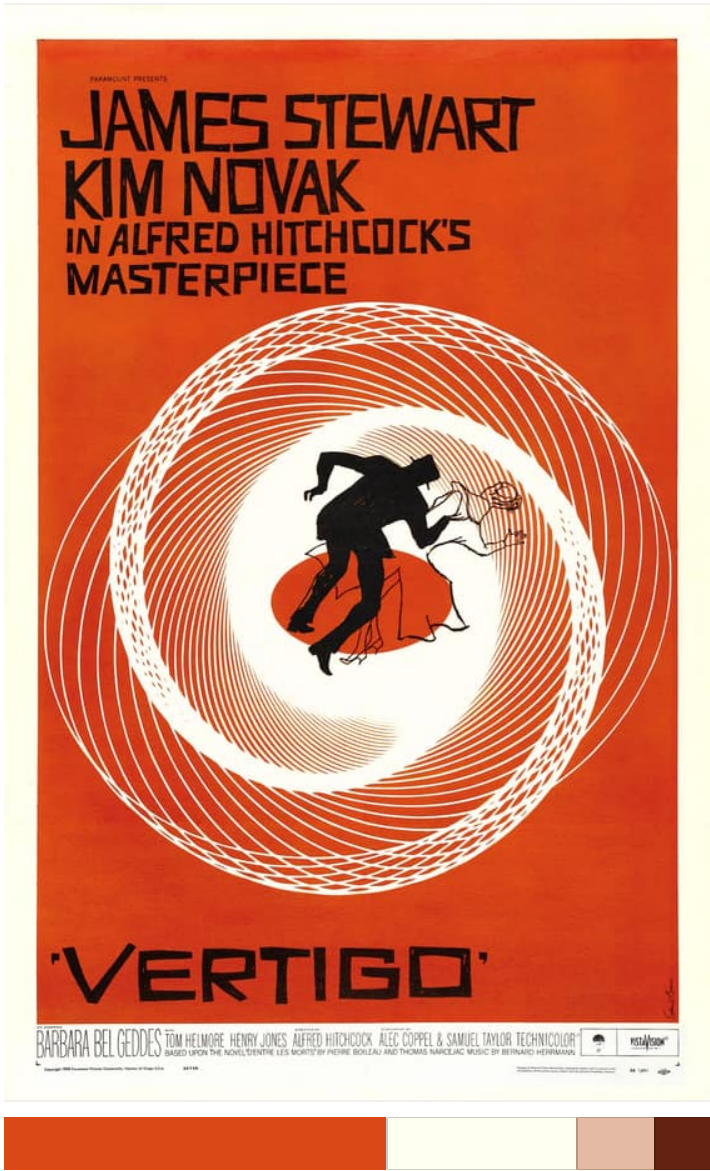
We are back to the small palettes from session 6, but this time the paper counts as one of the colors.

Three colors can make a whole cover

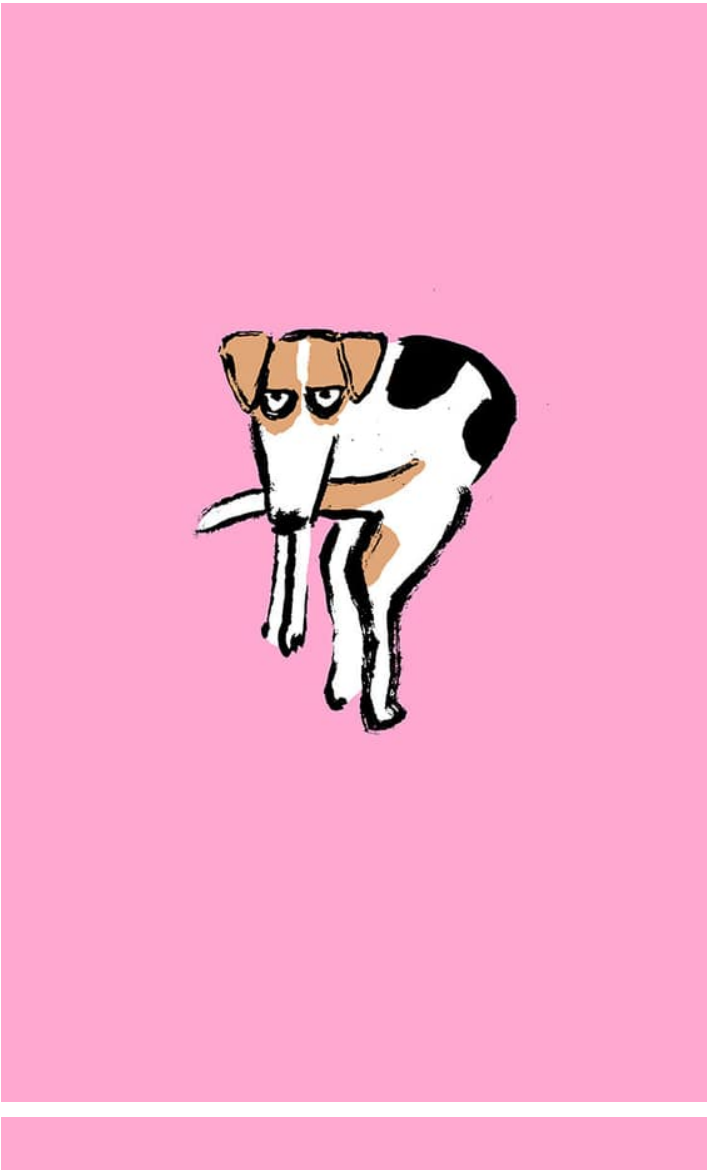
FROM SESSION 6



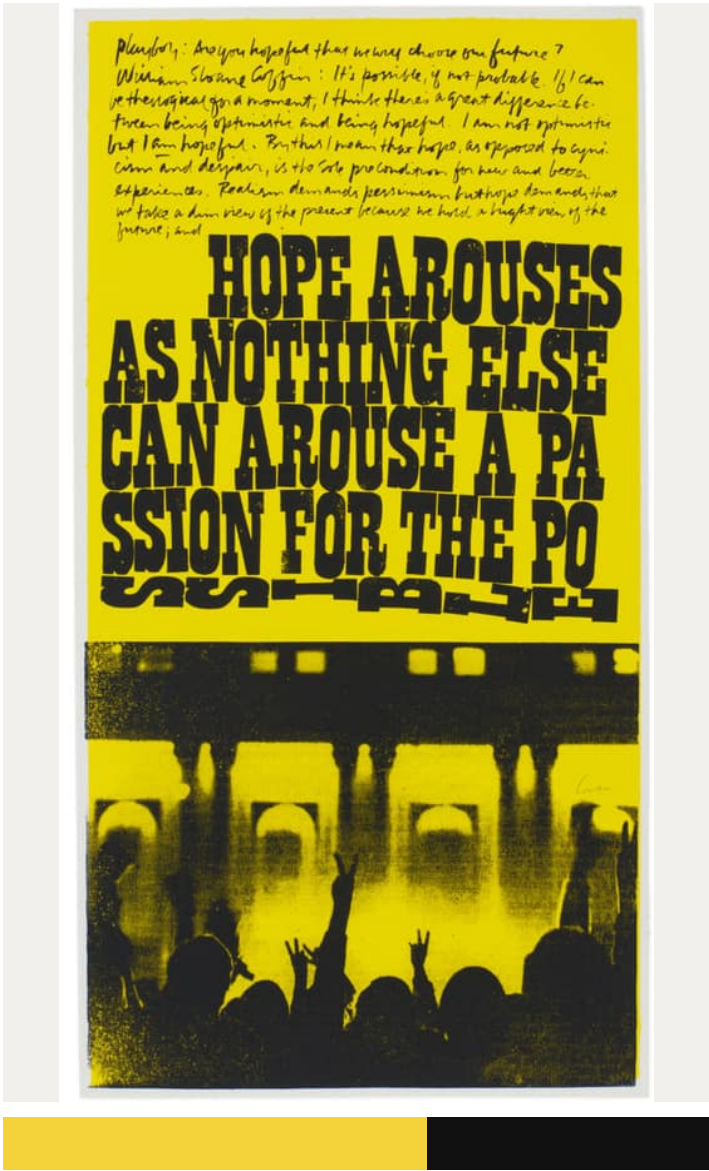
MALIKA FAVRE RED · BLACK · PALE TEAL



SAUL BASS 1958



JEAN JULLIEN BLACK ON ONE COLOR



CORITA KENT TWO INKS, SCREENPRINT

You saw these in session 6. Look again and count the inks: each one could be printed with three inks or fewer.

MALIKA FAVRE · THE NEW YORKER · SAUL BASS ·
VERTIGO, 1958 · JEAN JULLIEN · DOG, 2019 ·
CORITA KENT · HOPE AROUSES, 1969

On paper · one ink

One ink, four papers, four posters.

One ink is the cheapest way to print. Change the paper and the whole poster changes, at no extra cost.



NAVY ON WHITE
COOL, PLAIN



NAVY ON BROWN KRAFT
WARM, HANDMADE



NAVY ON PINK
A FLYER



NAVY ON GOLDENROD
A SHOW BILL

On paper · black and a spot

Black, one color, and the paper as a third.

Black plus one color is the oldest trick from session 6. The paper changes that color too: the same orange looks hot on white, rusty on brown paper and brown on blue.



ON WHITE
BLACK, ORANGE, WHITE



ON CREAM
SOFTER, OLDER



ON BROWN KRAFT
THE ORANGE GOES RUST



ON BLUE
THE ORANGE TURNS BROWN

SOLID (OPAQUE) INK COVERS THE PAPER INSTEAD. ASK YOUR PRINTER WHICH KIND THEY USE.

On paper • colored stock

Colored paper is a free extra color.

Black ink on bright paper looks like two colors for the price of one. See-through ink mixes with the paper color, so pick your ink and paper together.



BLACK ON ORANGE
TWO COLORS, ONE PASS



BLACK ON PINK
SAME FILE, NEW FLYER



YELLOW ON ORANGE
THE YELLOW NEARLY DISAPPEARS



WHITE ON BLACK
NEEDS SOLID INK: SCREENPRINT, NOT RISO

On paper · real zines

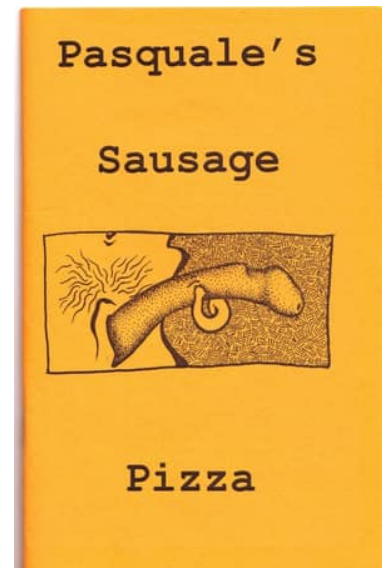
One black original, bright paper.

John Weston printed the pages of these zines on a copier, in editions of 35 to 50. The black is toner. Every color you see is the paper: yellow, pink, orange. Eyegasm switches paper color page to page, so the same black reads differently on each.



BLACK ON YELLOW AND PINK
TWO PAPERS IN ONE SPREAD

John Weston · Eyegasm · 2010 · 24 pages,
silkscreened cover, xerox insides on colored
paper, signed edition of 50 ·
johnwestonstudio.com



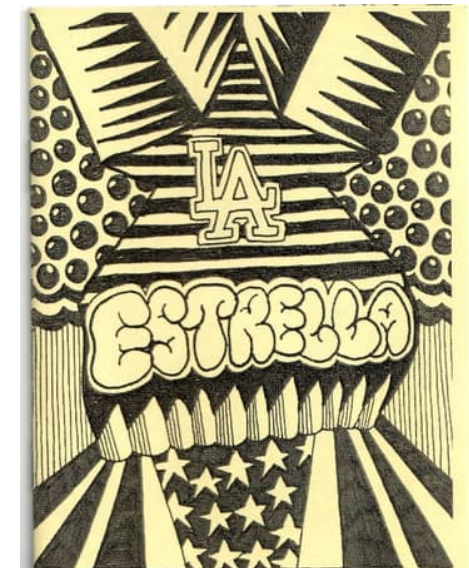
BLACK ON ORANGE
THE COVER

John Weston · Pasquale's Sausage Pizza · 2007 ·
xerox on orange paper, 48 pages, signed edition
of 35 · johnwestonstudio.com



ORANGE ALL THE WAY THROUGH
ONE PAPER FOR THE WHOLE ZINE

John Weston · Pasquale's Sausage Pizza · 2007 ·
johnwestonstudio.com



BLACK ON YELLOW
4.25 BY 2.75 INCHES

John Weston and Michelle Andrade · La Estrella ·
2007 · xerox on yellow paper, 16 pages, signed
edition of 50 · johnwestonstudio.com

On paper · DC zines

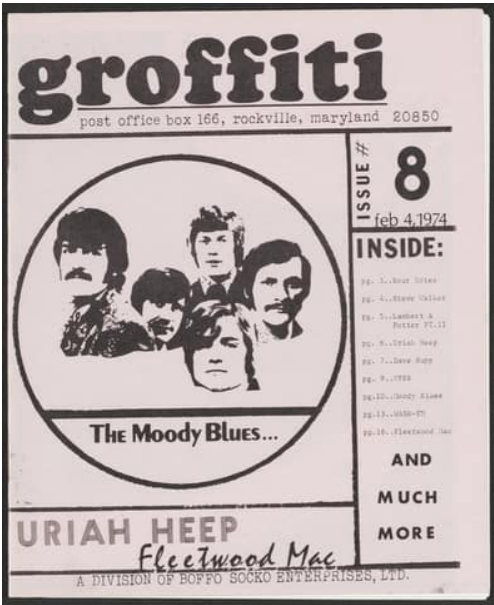
Same masthead, three papers.

The music zine groffiti came out of Rockville, Maryland. Three issues in six weeks of 1974 kept the same masthead and changed the paper: yellow, then pink, then green. Only the black is printed; the paper color makes each issue look new. Hit and Run, from the same archive in 1977, did the same on yellow.



BLACK ON YELLOW
ISSUE 6, JANUARY 7, 1974

groffiti, Issue 6 · Rockville, Maryland · 1974 · DC Punk Archive Zine Library, DC Public Library, Dig DC



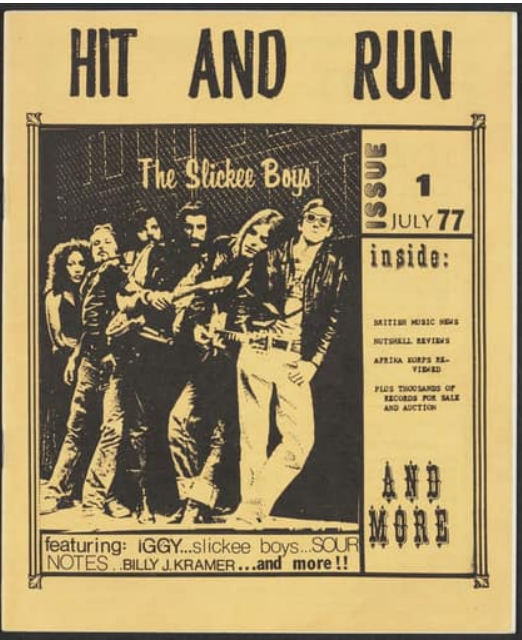
BLACK ON PINK
ISSUE 8, FEBRUARY 4, 1974

groffiti, Issue 8 · Rockville, Maryland · 1974 · DC Punk Archive Zine Library, DC Public Library, Dig DC



BLACK ON GREEN
ISSUE 9, FEBRUARY 18, 1974

groffiti, Issue 9 · Rockville, Maryland · 1974 · DC Punk Archive Zine Library, DC Public Library, Dig DC

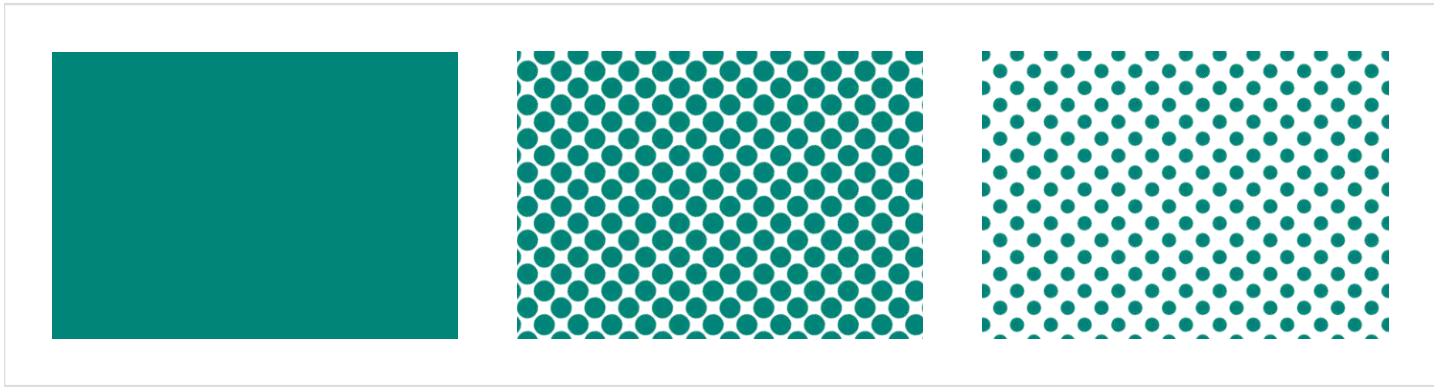


BLACK ON YELLOW
HIT AND RUN, NO. 1, JULY 1977
Hit and Run, Number 1 · July 1, 1977 · DC Punk Archive Zine Library, DC Public Library, Dig DC

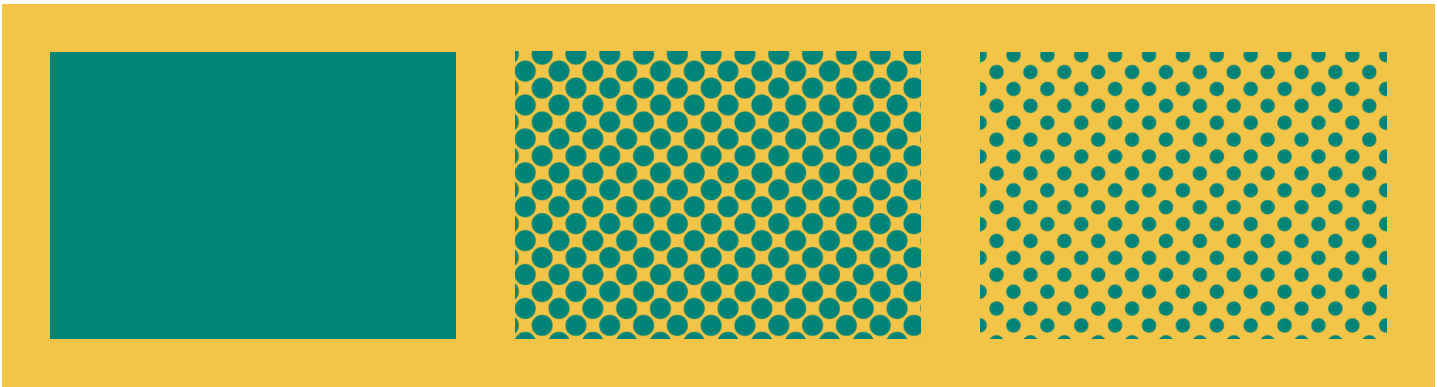
On paper · tints

A tint lets the paper show through.

A lighter shade of one ink is really dots, with paper showing between them. On white paper it looks lighter. On colored paper it looks like a whole new color.



TEAL ON WHITE
100 · 60 · 30

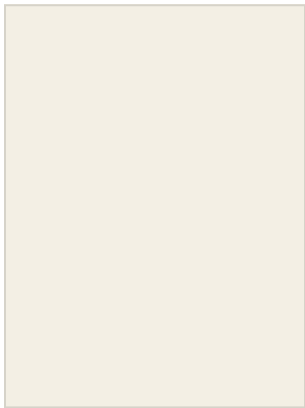
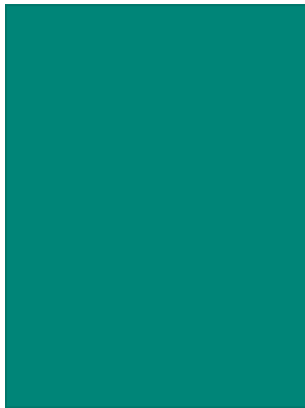
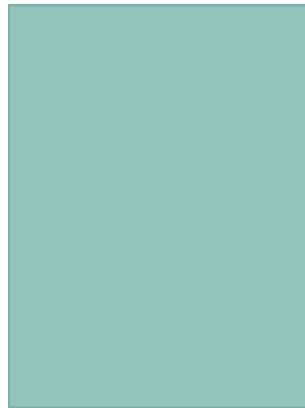
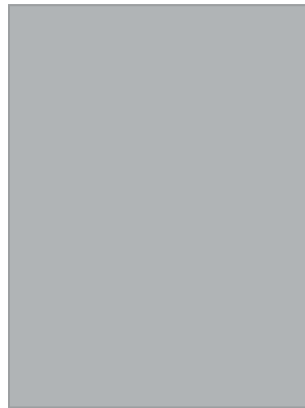
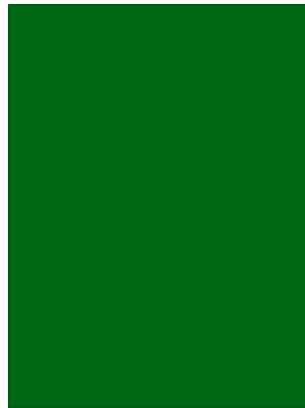


TEAL ON GOLDENROD
100 · 60 · 30, NOW READING AS GREENS

On paper · three inks

Three inks, nine colors.

The sample poster uses three inks. Add the paper, the overlaps and the lighter dotted shades, and those three inks give you nine colors.

								
PAPER NO INK	YELLOW INK 1	TEAL INK 2	NAVY INK 3	TEAL 40% LIGHTER, IN DOTS	NAVY 30% LIGHTER, IN DOTS	TEAL OVER YELLOW OVERLAP	TEAL 40% OVER YELLOW DOTS + OVERLAP	NAVY 30% OVER YELLOW DOTS + OVERLAP

THESE ARE SCREEN PREVIEWS. REAL INK LOOKS A LITTLE DIFFERENT, SO PRINTERS DO A TEST PRINT FIRST.

On paper · two spot inks

Two inks, every issue.

Posterzine is a magazine that folds out into a big poster. Every issue is printed in just two spot inks on white paper, and the pair changes each time. Where the two inks overlap, you get a third color for free.



ORANGE AND BLUE
COLOPHON FOUNDRY ISSUE

Posterzine · Colophon Foundry issue · People of Print · two Pantone inks on Fedrigoni Arcoprint Extra White · peopleofprint.com



CORAL AND LIGHT BLUE
KILLER ACID ISSUE

Posterzine · Killer Acid issue · People of Print · peopleofprint.com



BLUE AND PINK
ANTHONY BURRILL ISSUE

Posterzine · Anthony Burrill issue · People of Print · peopleofprint.com



PINK AND PURPLE
PHOTOS PRINTED IN TWO INKS

Posterzine · People of Print · peopleofprint.com

On paper · three inks

Pick a light, a middle and a dark.

This is the same rule as session 6. If all three inks are medium tones, the poster turns to mud from across the room. Printers print light to dark, so your dark line goes down last and covers small mistakes.



IN COLOR



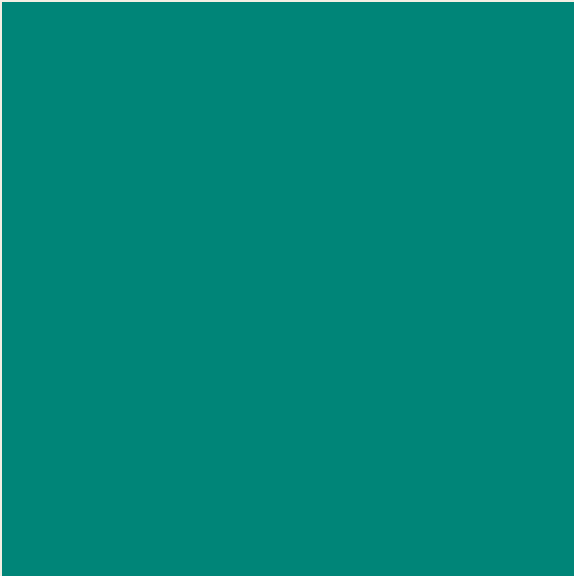
GRAY
LIGHT, MIDDLE, DARK STILL SEPARATE

TRY IT ON YOUR OWN FILE NOW: TAKE A SCREENSHOT AND TURN IT BLACK AND WHITE.

Inks in your file

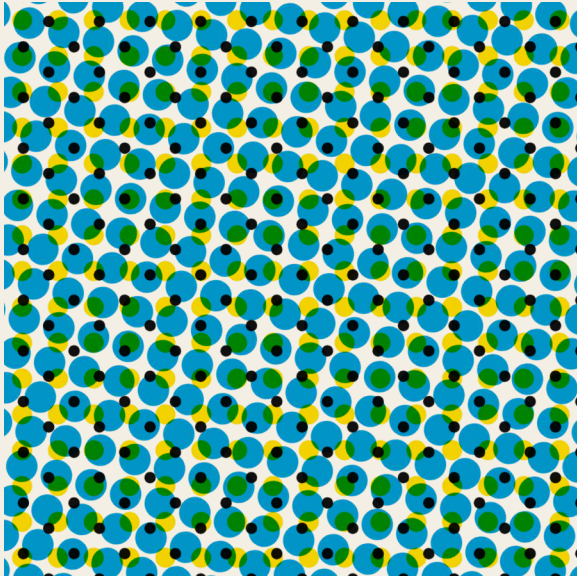
Now to your poster: how a printer looks at it, how to set up the inks, and what you turn in.

Two ways to get a color onto paper.



One ink, mixed in a bucket to a numbered recipe.

PANTONE 3282 C



Dots of cyan, yellow and black, side by side and on top of each other.

CMYK, ENLARGED

SPOT COLOR

ONE INK, MIXED TO THE EXACT COLOR. ALSO THE ONLY WAY TO PRINT METALLIC, FLUORESCENT OR WHITE.

FOUR-COLOR (CMYK)

FOUR INKS IN DOTS TOO SMALL TO SEE. IT CAN PRINT PHOTOS, BUT NO COLOR IS QUITE AS CLEAN AS A SPOT COLOR.

FROM ACROSS THE ROOM THE RIGHT ONE LOOKS TEAL TOO, BECAUSE THE DOTS BLEND IN YOUR EYE.

Pantone gives every ink a number.

Pantone is a book of numbered ink colors that every printer has. You write PANTONE 123 C on your file, and the printer mixes that exact color.

The book

A FORMULA GUIDE

A fan of printed color samples, each with a number and a recipe.

C and U

SHINY, ROUGH

C is for smooth, shiny paper. U is for rough paper. The same ink looks duller on rough paper.

Trust the book

NOT THE SCREEN

The color on your screen is only a guess. The printed sample is the real color.



PANTONE FORMULA GUIDE
Parhamr · PantoneFormulaGuide-solidMatte-2005edition · 2007 · Parhamr, CC BY-SA 3.0, via Wikimedia Commons

A color book is a printed list of inks.

In 1963 Lawrence Herbert, at a small New Jersey printing company called Pantone, printed a fan of numbered colors, each with a recipe mixed from a short list of base inks. Any printer with the same base inks can mix the same color.

BOOK	WHERE IT IS USED	IN ILLUSTRATOR AND INDESIGN
Pantone UNITED STATES, WORLDWIDE	Brand colors, packaging, most print shops.	Needs a paid Pantone Connect account since 2022. Or make a swatch and type the number as its name.
TOYO and DIC JAPAN	Japanese printers and packaging.	Built in: <code>Swatch Libraries > Color Books</code> .
HKS GERMANY	German and European printers.	Built in, same menu.
Riso inks ABOUT 20 COLORS	Riso studios. Each ink has its own name.	Most riso shops send a swatch file. Ask for it.
Your own MIXED BY EYE	Screenprinters often mix to a sample.	Name the swatch for the ink, like <code>Tea1</code> , and bring a printed sample.

Three kinds of swatch.

Illustrator and InDesign have three kinds of swatch, and only a spot swatch gets its own plate.

KIND	WHAT IT IS	WHAT IT PRINTS ON	HOW TO SPOT IT
Process A CMYK MIX	A color made of C, M, Y and K amounts.	The four CMYK plates.	A plain square.
Global process AN EDITABLE MIX	A CMYK mix you can change everywhere at once. Edit the swatch and every shape using it changes.	The four CMYK plates.	Illustrator: a white corner triangle.
Spot ONE REAL INK	One ink, mixed in a bucket. Lighter shades of it are still the same ink.	Its own plate.	Illustrator: a corner triangle with a dot. InDesign: the spot icon beside the name.

ONE INK, ONE NAME. TWO SWATCHES WITH DIFFERENT NAMES FOR THE SAME INK BECOME TWO PLATES.

Each extra ink means another screen and another pass.

INKS	WHAT THE PRINTER HAS TO MAKE	WHAT THAT MEANS
1 ONE COLOR	One screen and one pass, with the paper as the second color.	The cheapest and fastest, good for a flyer, a shirt or a stamp.
2 or 3 A GIG POSTER	One screen per ink, lined up on the same marks each pass. Usually light to dark.	Most screenprinted posters use two or three inks.
4 and up MORE SCREENS	Each extra ink adds setup, washup, drying time and another chance to miss the marks.	Printers charge per color, not per square inch.
CMYK PROCESS	Four plates of fine dots that make any color. Offset or digital, almost never by hand.	Good for photos and full color. An exact spot color needs a fifth ink, at extra cost.

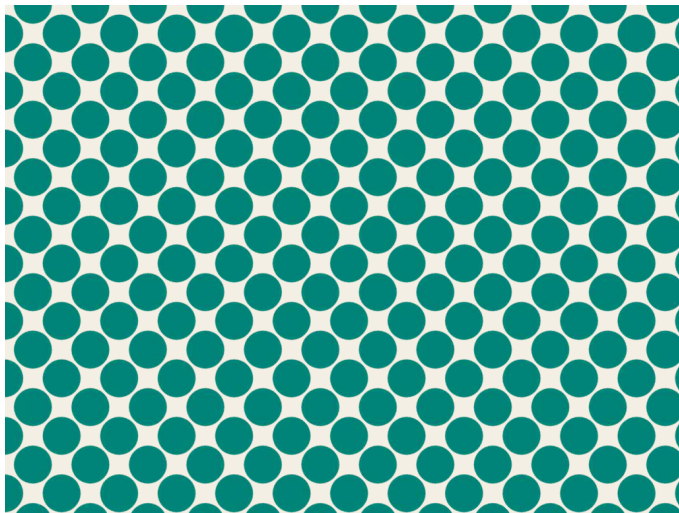
YOUR BRIEF SAYS THREE COLORS PLUS THE LINE. THAT IS FOUR SCREENS.

A tint is the same ink, broken into dots.

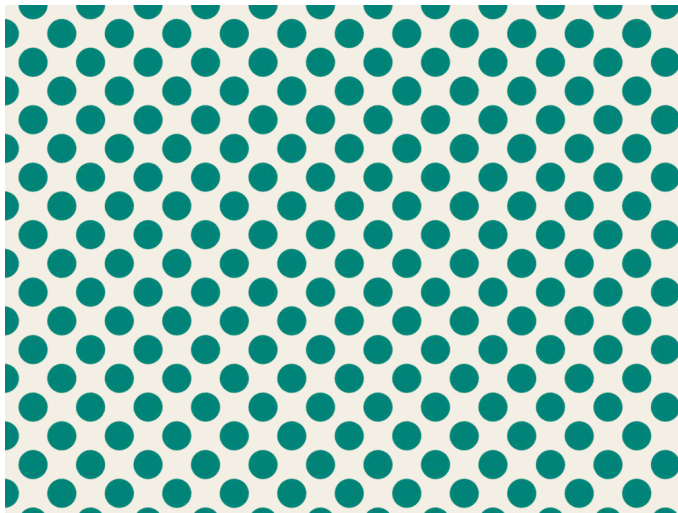
To get a lighter teal, the printer does not mix a new ink. It prints the same teal as dots that cover 40% of the paper. From a distance it looks lighter, and it costs nothing extra.



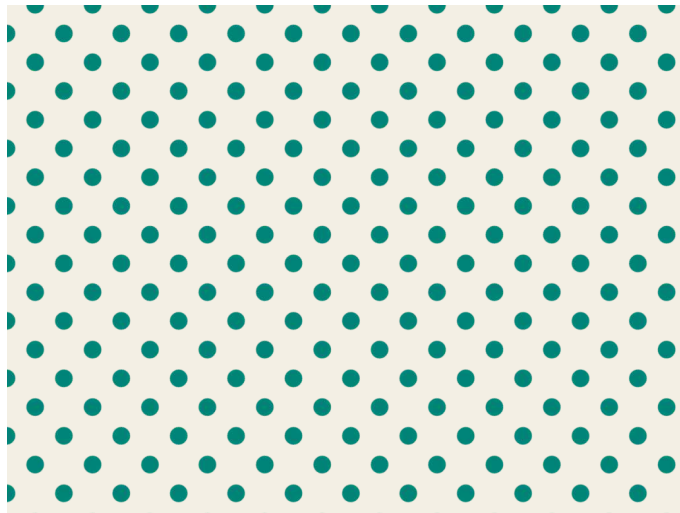
100%
SOLID INK



70%
BIG DOTS, SMALL GAPS



40%
PAPER SHOWS THROUGH



15%
SMALL DOTS, MOSTLY PAPER

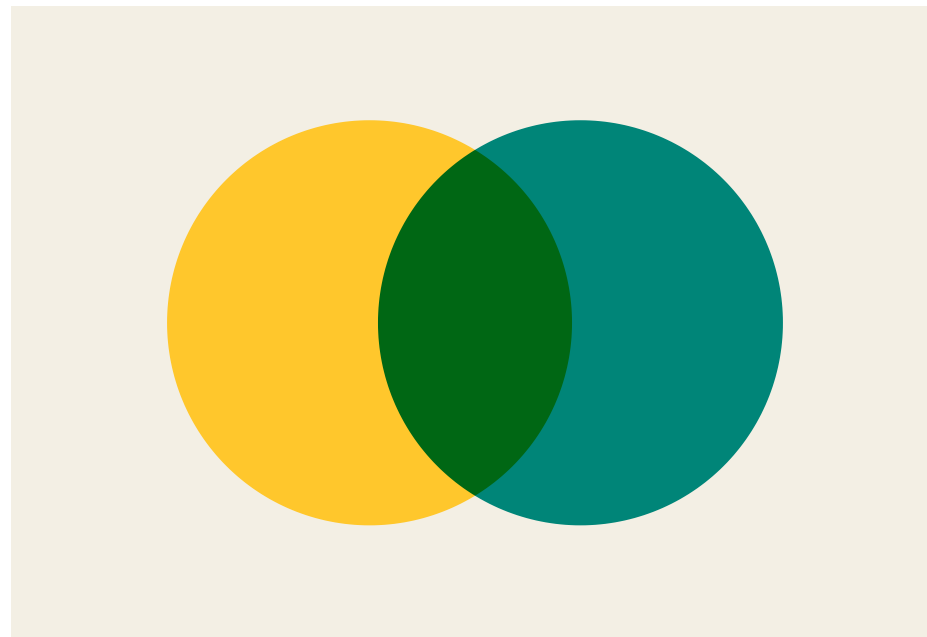
THE DOTS ARE DRAWN HUGE HERE SO YOU CAN SEE THEM.

Where two inks meet, you choose what happens.



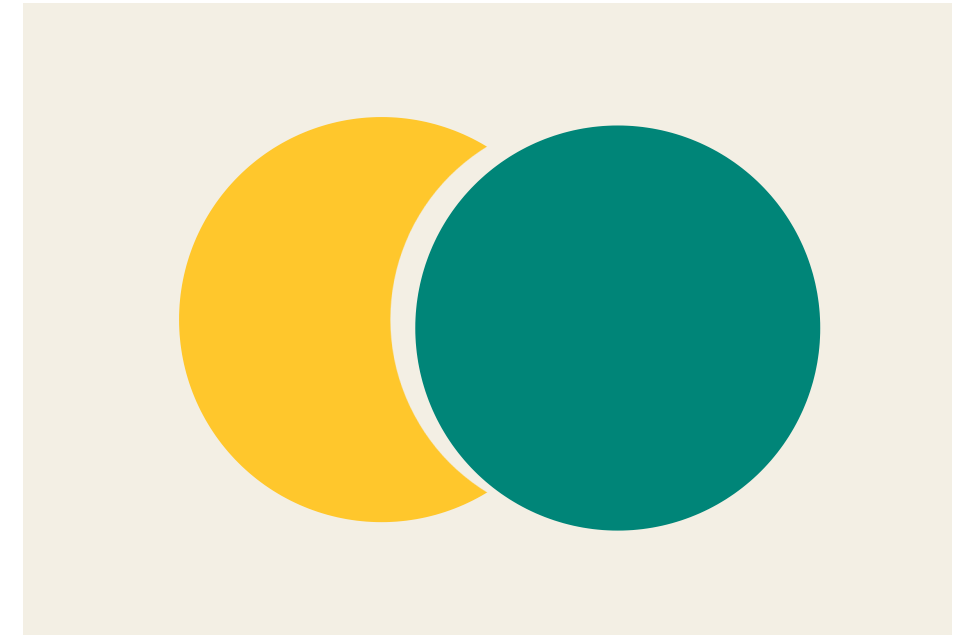
KNOCKOUT

THE YELLOW HAS A HOLE CUT WHERE THE TEAL GOES, SO TEAL STAYS TEAL. THIS IS WHAT ILLUSTRATOR DOES UNLESS YOU CHANGE IT.



OVERPRINT

NO HOLE. TEAL PRINTS RIGHT ON TOP OF YELLOW, AND YOU GET A THIRD COLOR, DARK GREEN, FOR FREE.



SLIGHTLY OFF

THE TEAL LANDED A LITTLE TO THE RIGHT, AND A THIN WHITE GAP SHOWS. A SMALL OVERLAP BETWEEN THE COLORS HIDES IT.

SET YOUR BLACK LINE TO OVERPRINT. THEN EVEN IF A COLOR LANDS A LITTLE OFF, NO WHITE GAP SHOWS NEXT TO THE LINE.

How a printer reads a poster

Three inks and the paper.

This poster was made up for this lesson. Look at it the way a printer would: which ink prints each shape, and where do two inks overlap?

Ink 1 PANTONE 123 C	Yellow prints the sun and its reflection. It goes first because it is the lightest.
Ink 2 PANTONE 3282 C	Teal prints solid for the water and in dots for the lighter sky. The date is cut out of the water so the paper shows through.
Ink 3 PANTONE 2767 C	Navy prints the line and the words, last and on top of everything.
The paper CREAM STOCK	The paper is a free fourth color. Every light area is bare paper.



INVENTED FOR THIS LESSON · MARSH NIGHT MARKET

How a printer reads a poster

The same poster, as the printer gets it.



PLATE 1 · YELLOW 123 C
PULLED FIRST

PLATE 2 · TEAL 3282 C
SOLID, PLUS DOTS FOR THE SKY

PLATE 3 · NAVY 2767 C
THE LINE, LAST

THE KEY
WHAT THE INKS MAKE TOGETHER

EVERY PAGE IS BLACK ON WHITE, NO MATTER WHAT COLOR IT PRINTS. THE TARGET MARKS ARE IN THE SAME PLACE ON EVERY PAGE, SO THE COLORS LINE UP.

Spot colors in Illustrator and InDesign

A live demo. Set up your inks first and the separations are easy. Pick random colors and you will have to redo the file later.

Make one swatch per ink.

01	Swatches panel menu > New Swatch
02	Color Type: Spot Color .
03	Name it with the ink: PANTONE 123 C , or Yellow if you are mixing your own.
04	Want the official Pantone colors? Window > Swatch Libraries > Color Books . Newer versions need a paid Pantone login. If you do not have one, make your own swatch and type the Pantone number as its name.
05	Color every shape with these swatches and nothing else. Delete the rest: Select All Unused > Delete .

SWATCHES · THE DEMO POSTER		
	PANTONE 123 C	SPOT
	PANTONE 3282 C	SPOT
	PANTONE 2767 C	SPOT
	[Registration]	ALL PLATES

THE WHOLE FILE USES FOUR SWATCHES

Tints, overprint, and checking the plates.

Lighter shade

SAME INK

Select the shape, open `Window > Color` , and drag the T slider down. It is still the same ink, just lighter.

Overprint

THE LINE ON TOP

Select the line, then `Window > Attributes > Overprint Fill` (and Overprint Stroke). See it with `View > Overprint Preview` .

Check the plates

BEFORE YOU EXPORT

`Window > Output > Separations Preview` . Turn on Overprint Preview, then click the eye on each ink. If anything shows up under CMYK, it is a color you forgot to switch to one of your inks.

The scan

YOUR LINE

Use Image Trace (Black and White, Ignore White) and color it with your line swatch.

What a clean file looks like in Separations Preview.

CMYK
SHOULD BE EMPTY

Click the eye on CMYK off. Nothing on the poster should change.

Each ink
ONE AT A TIME

Turn on one ink at a time. You should see exactly the shapes that ink prints, and nothing else.

Layers match
ONE LAYER PER INK

Name each layer after its ink: 1 Yellow , 2 Teal , 3 Navy . Line layer on top. A Marks layer for the target marks.

SEPARATIONS PREVIEW · OVERPRINT PREVIEW ON	
 CMYK	EMPTY
 PANTONE 123 C	ON
 PANTONE 3282 C	ON
 PANTONE 2767 C	ON

THREE INKS, NOTHING IN CMYK

The same inks in InDesign.

- 01

Place your Illustrator poster: `File > Place` . Its spot inks show up in the Swatches panel on their own.
- 02

New spot ink: Swatches panel menu > `New Color Swatch` , Color Type: `Spot` . Use the same name as in Illustrator.
- 03

Same ink under two names? Swatches panel menu > `Ink Manager` , and set one as an alias of the other so they print on one plate.
- 04

Check the plates: `Window > Output > Separations Preview` , the same as Illustrator.
- 05

Export: `File > Export > Adobe PDF (Print)` . Under Output, Color Conversion: `No Color Conversion` , so your spot inks stay spot inks.

MOVE SWATCHES BETWEEN APPS	
Illustrator	Swatches menu > Save Swatch Library as ASE
InDesign	Swatches menu > Load Swatches

ONE .ASE FILE, THE SAME INKS IN BOTH

Your files

What a printer needs for a poster like yours, and how to set up your Illustrator or Photoshop file.

What every printer will ask you.

Size FINISHED SIZE	18 by 24 inches. If your art goes to the edge, add 1/8 inch extra on every side, called bleed.
Inks A LIST	How many, which ones, by name or Pantone number, and the order they print. Light to dark.
Separations OR A LAYERED FILE	One black page per ink, with target marks.
A key THE COLOR PROOF	The poster in color, so they know what it should look like.
Paper AND HOW MANY	Paper color and thickness, and whether it is shiny or rough. The number of copies also decides how it gets printed.

The Illustrator file.

-
- | | |
|----|---|
| 01 | Artboard <code>18 x 24 in</code> , document color mode <code>File > Document Color Mode > CMYK</code> . |
|----|---|
-
- | | |
|----|--|
| 02 | One spot swatch per ink, and nothing colored with anything else. |
|----|--|
-
- | | |
|----|---|
| 03 | One layer per ink, named like the swatch, line on top. A <code>Marks</code> layer with four targets colored <code>[Registration]</code> . |
|----|---|
-
- | | |
|----|--|
| 04 | Your line: traced, colored with the line swatch, and set to overprint. |
|----|--|
-
- | | |
|----|--|
| 05 | Turn type into shapes: <code>Type > Create Outlines</code> . Avoid gradients and effects unless they look right in Separations Preview. |
|----|--|
-
- | | |
|----|---|
| 06 | Save <code>lastname-p2-working.ai</code> . Then <code>File > Save a Copy</code> as a flattened PDF at 18 × 24. |
|----|---|
-

The Photoshop file.

01 Canvas 18 x 24 in at 300 ppi . Bring in the line from the 600 ppi scan, cleaned up to pure black and white.

02 One layer per ink, named after the ink. Each layer holds only that one color, solid or lighter. Line on top, set to Multiply.

03 No effects or adjustment layers that create new colors. If a color is not on an ink layer, it will not print.

04 Optional: Channels panel menu > New Spot Channel sets up a real ink in Photoshop.

05 Textures and soft shading turn into dots when printed. Keep them bold, and check them at 100%.

06 Save lastname-p2-working.psd with every layer, plus the flattened PDF.

Making the separations PDF.

STEP	ILLUSTRATOR	PHOTOSHOP
1 · Copy NEVER THE WORKING FILE	Save a copy as <code>lastname-p2-seps.ai</code> .	Save a copy as <code>lastname-p2-seps.psd</code> .
2 · Go black EVERY INK	Double-click each ink swatch and change it to black. Everything in that ink turns black at once.	Add a black Color Overlay to every ink layer.
3 · One at a time PLUS THE MARKS	Show one ink layer and the Marks layer. Save a Copy as PDF. Repeat for each ink.	Show one ink layer and the marks. Save a Copy as PDF. Repeat for each ink.
4 · Combine ONE FILE	Drag the pages into one PDF in Preview, in printing order, light to dark, with the color key last: <code>lastname-p2-separations.pdf</code> .	

What you hand in on Oct 15.

FILE	WHAT IT IS
The working file .AI OR .PSD	Your layered file: one named layer per ink.
The poster FLATTENED PDF	18 by 24, in color.
The proof LETTER SIZE	The poster printed to scale on letter paper. This is the print we pin up at critique, next to your drawing.
Separations ONE PDF	One page per color, including the line, in solid black with target marks, plus one page in color.
The drawing ON PAPER	The original ink drawing.
The studies ONE PDF	Your in-class studies, together.

Work time

Now, on your own file.

Today

IN THIS ORDER

Count your colors and get down to three plus the line. Make your ink swatches and put every shape on an ink layer. Then keep working, and I will come around to your desk.

Thursday Oct 8

SCREENPRINT SETUP

We set up your poster for screenprint, one step at a time, and make the films.

Fall break

OCT 13

Use the time to finish, and build the separations before you come back.

Thursday Oct 15

CRITIQUE

Project 2 due, with every file on the hand-in list.

STUCK ON THE SEPARATIONS? FINISH THE POSTER FIRST. THE SEPARATIONS ARE AN HOUR ONCE THE FILE IS CLEAN.