# week::six
Color for Offset Printing

CMYK Basics

It's a Subtractive Color System
- o Color + Color + Color = Black (but not IRL)
- o The "off" color is the color of the printed-upon medium.
- o CMYK Printing Pseudonyms: *Process Color; Full-color; 4-color*

It's All About the Ink
- o In CMYK, we control exactly where ink is placed on the page, and exactly how much ink is laid down on paper.
- o It is possible to place **too much ink** on the page.
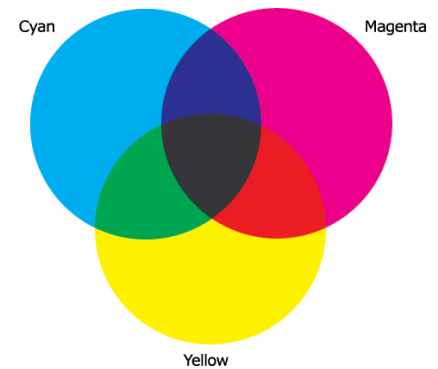
Measured in Percentages
- o 0% – 100% per ink
  - ▪ 0% = no ink; 100% = maximum coverage
- o The measurement of the amount of ink in a single spot on the printed page is called **Total Ink**.
  - ▪ A common maximum is 280% total ink coverage (though this number varies based on the type of printing press, paper (coated or uncoated?), and other printing conditions).
- o Percentages are added together to calculate total ink.
  - ▪ For example, a 4-color press can print up to 400% coverage at a single spot.

One Color, Many Formulas
- o Unlike RGB and LAB, there are **many different ways** to define a single color in CMYK.
- o The reason for this is the addition of a fourth ink: **Black**.

Primary Color Formulas

Magenta + Yellow = **Red**	Magenta + Cyan = **Blueish-Purple**	Cyan + Yellow = **Green**	Magenta + Cyan + Yellow = **Muddy Brown-ish**

The Role of blacK
- o Adding K to any of these mixes only *darkens* the color

The Unwanted Color
- o In creating the primary mixes above, adding the third color ink only pushes the color towards brown/neutral.
- o Can be used to dull a primary color mix.

Cyan is Not "Pure"
- o Due to unavoidable errors in manufacturing, most cyan inks contain some magenta component
- o CMYK Blue must contain more Cyan than Magenta
  - ▪ CMYK Blue is approximately 100c 90m 0y 0k
- o Neutrals must contain more Cyan to actually be neutral
 - ▪ 50% gray is approx. 58c 47m 47y 8k

Yellow is the Weakest Ink
- o It is easily contaminated by other inks

Working with Color in InDesign

Panels

- o Window > Color (F6)
  - § Use for "casual" color selection. Do not use to specify a new color for a page element.
  - § Best for setting the tint of an existing swatch color.
- o Window > Swatches (F5)
  - § Used for more "formal, methodical" color selections.
  - § This is the panel to **define and manage** your colors.
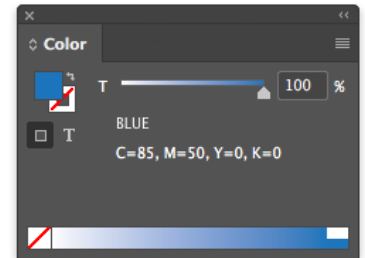
Swatch Panel Iconography

- o Swatches can be either **Process** (▨) or **Spot** (◉) colors.
- o They can be defined using the **CMYK** (▧), **RGB** (▮) or **LAB** (▥) color models.
  - § However, always use CMYK for print. Period.
- o The ✛ indicates the Registration color.
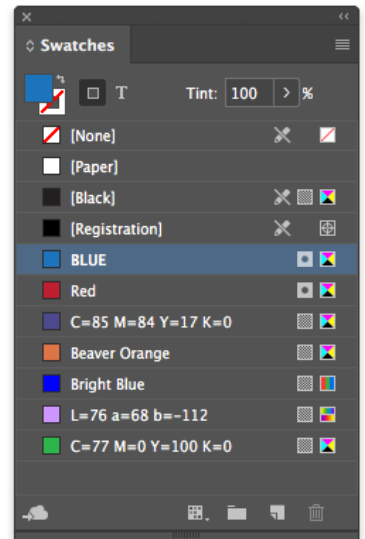
Special InDesign Swatch Entries

- o [None]
- o [Paper]
  - § By editing the [Paper] swatch, you can change the color of the paper as it appears in InDesign.
- o [Black]
  - § See display options on next page.
- o [Registration]
  - § All inks outputted at the time of printing (including spot colors).

Separations Preview

- o Window > Output > Separations Preview
- o Displays a preview within InDesign of how each individual printing ink plate will appear when *separations* are sent to a commercial printing press.
- o Separations often reveal errors and inconsistencies in the technical make-up of ink in a publication.
  - § This enables you to proof and troubleshoot a document *before* it gets put on the press, saving you and your clients money.
- o The Separations Preview panel can show the **ink usage** and **total ink** of an artwork area simply by moving your mouse over your document.
- o You can correctly view **Overprint** and **Knockout** areas of a layout before printing them out (see next page for more info).
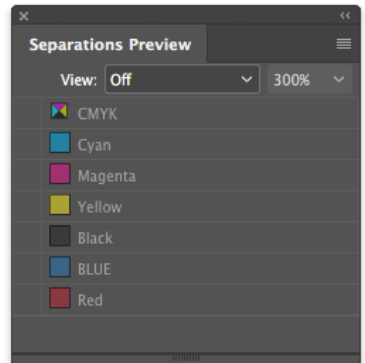
Flattener Preview

- o Window > Output > Flattener Preview
- o A tool to identify and diagnose elements with transparency and rasterization.

Display of Black

- o InDesign > Preferences > Appearance of Black to control its appearance.
- o For print work, be sure to set the display of black to *Display All Blacks Accurately* for on-screen viewing, and *Output All Blacks Accurately* for printing & exporting.
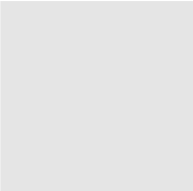
— Lecture Outline —
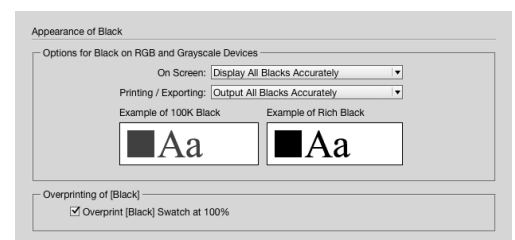
Overprinting & Knockouts

Knockout

- o *Defined:* Removing the ink beneath another color.
- o Ensures that unwanted ink will not contaminate a desired color.
- o Is the default setting in most print circumstances.

Overprint

- o *Defined:* Printing one ink over another.
- o Done to help prevent color registration errors, especially with type over a colored background.
- o By default, **Black ink printed at 100% overprints** all other inks (since it is the most dark and opaque ink).

|				
Composite Example: 100% black G placed above a light blue background. (65c, 25m, 10y, 10k).	G (black G on light blue background)			
Fill set to Overprint (default for text)	C	M	Y	K (black G)
Fill set to Knockout	C (white G)	M (white G)	Y (white G)	K (black G)

Attributes Panel

- o Provides control of overprinting for specific page elements.
- o Window > Attributes
- o **Overprint Fill** forces InDesign to overprint the fill of an element.
- o **Overprint Stroke** forces InDesign to overprint the stroke of an element.
- o **Overprint Gap** controls the printing of color applied to the open spaces in dashed, dotted, or patterned lines.
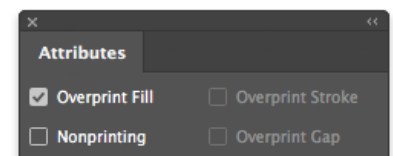
Ink Manager Panel

o   Swatches Panel Submenu > Ink Manager...

o   Provides control over inks when output.

o   Allows for the re-mapping of inks, including the conversion of Spot color to process colors.

o   Example: CMYK plus two Spot colors
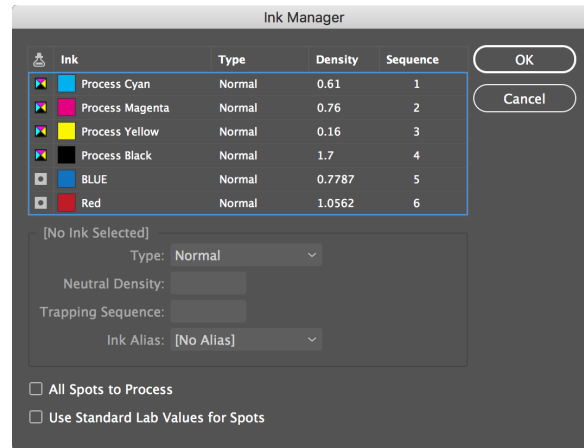
A Quick Note about Spot Colors

Defined

o   Spot colors are inks tinted to a specific color.

o   This allows for a designer to add color to a document without the expense of using full-color offset printing.

- For example, a newsletter might use black ink plus one Spot color (blue, etc.)
- More common these days, spot colors are used in package design to maintain absolute color consistency across products on store shelves.

o   Spot colors also allow for the use of specialty inks, like metallic and fluorescent colors that cannot be re-created using Process colors.

o   In the U.S., the color standard used for inks is the **Pantone Color System**.

- InDesign and Illustrator traditionally have a number of built-in color swatches from Pantone, as well as other vendors.
- However, Adobe's license for these swatches from Pantone expired recently, and convenient use of Pantone swatches now costs $14.99 a month (!!).
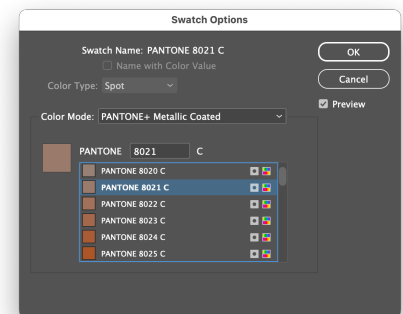
Duotones

What Are They?

o   Duotones are a method of reproducing grayscale imagery using multiple printing inks.

o   Even after being converted to a Duotone, the image remains, at its core, a Grayscale image. Individual ink channels are not accessible via the Channels panel.

o   Duotones extend the tonal range of printed grayscale photographs by reproducing the image using two or more inks.

- This is why in process print jobs, black and white image are often converted to CMYK before printing (essentially creating a Quadtone image). These images have greater tonal range than images just printed with black ink.

o   To create in Photoshop, convert your image to Grayscale, then to Duotone. Save the resulting image as a native PSD for placement into others program.

Troubleshooting Color in InDesign

**Make sure your swatches are in the CMYK color mode.**
- o   No RGB or LAB-based colors (unless they are spot colors).

Make sure Spot colors are Spots, and Process colors are Process.
- o   Only use spot colors intentionally.
- o   Sometimes imported images will include unwanted spot colors — be sure to resolve these before sending your file to the printer.
- o   Use Separations Preview to see exactly how many plates you'll be generating.
- o   Use Window > Output > Preflight to check on the status of your inks.

Don't change the name of Spot colors—ever! This goes for both Illustrator and InDesign.
- o   Remember that imported .eps and .ai files that contain Spot colors will add their Spot colors to the Swatches panel.
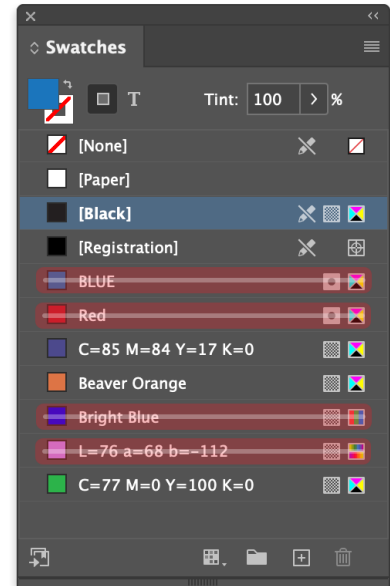
Use tints of existing colors instead of defining new ones
- o   If the base-color of a tint is changed, all occurrences of that color are changes as well.

Use Window > Output > Flattener Preview to view potential problems area with transparency in your document.

Name your Process colors with the CMYK values.
- o   InDesign does this by default—use Name with Color Value option.

Remove unused colors from your Swatches panel from time-to-time, and before sending the job in for printing.
- o   Use the Swatches panel sub-menu > Select All Unused, then delete the selected swatches.

Add existing non-Swatch colors to your Swatches panel automatically.
- o   Use the Swatches panel sub-menu > Add Unnamed Colors