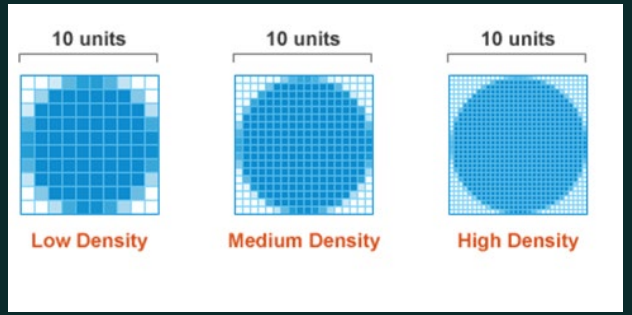
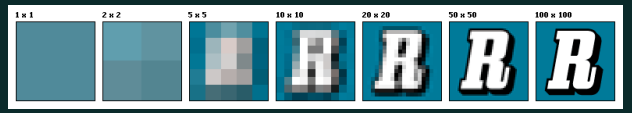
PIXELS, RESOLUTION & IMAGE SIZE

Understanding how digital images are measured, displayed, and output across screens and print.

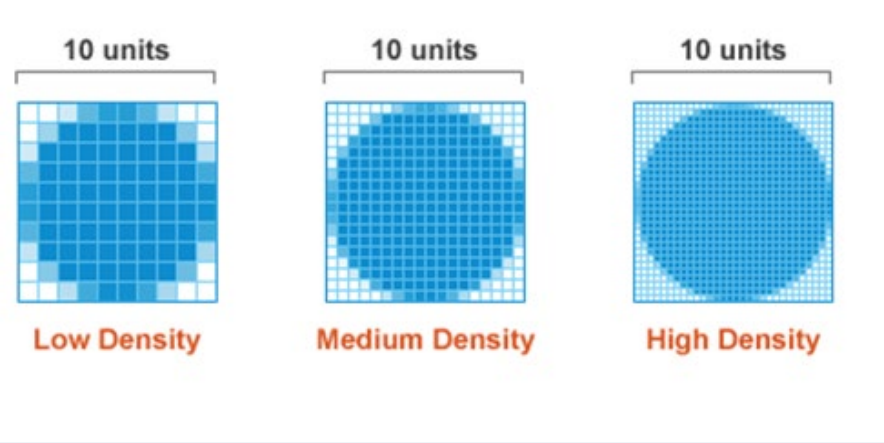
What is a Pixel? · *PPI vs DPI* · *Resolution for Screen & Print* · *Image Size & File Size* · *Paper & Ad Sizes*

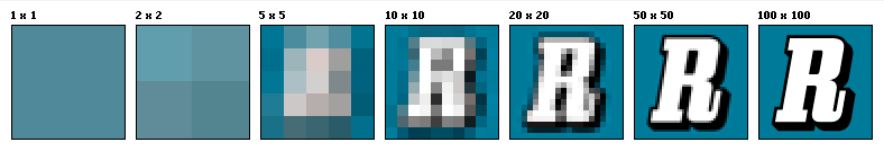




pixel density varies with resolution

WHAT IS A PIXEL?





As pixel count increases, image detail improves

Definition

A pixel (picture element) is the smallest unit of a digital image - a tiny square of a single colour or shade.

Pixel Grid

Digital images are made up of a grid of pixels. The more pixels in an image, the more detail it can contain.

Colour per Pixel

Each pixel stores one colour value. In RGB images that's Red, Green & Blue combined — giving up to 16.7 million possible colours.

Pixel Density

Packing more pixels into the same physical area increases sharpness — this is called pixel density, measured in PPI.

RESOLUTION — PPI & DPI

PPI — Pixels Per Inch

PPI describes the pixel density of a digital image or display. Higher PPI = more detail per inch on screen.

DPI — Dots Per Inch

DPI describes the dot density of a physical printer. Higher DPI = finer, sharper printed output.

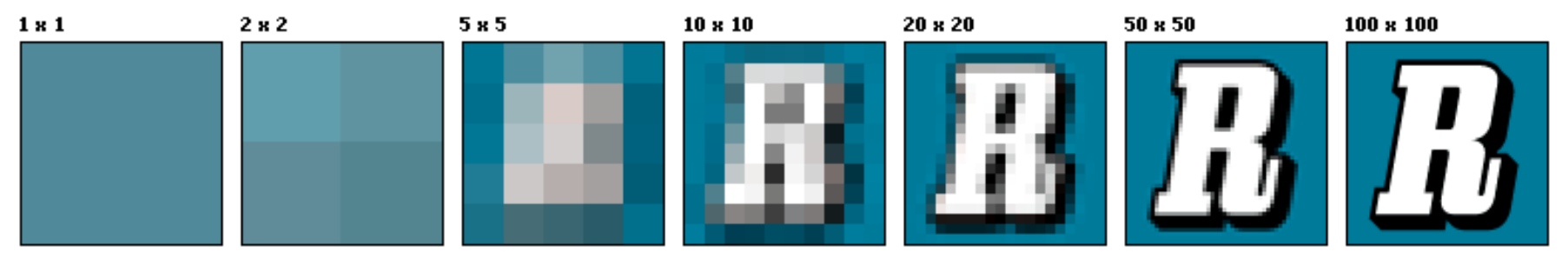
Screen Standard: 72 PPI

Web and screen images are typically 72 ppi — adequate for monitors without unnecessary file size.

Print Standard: 300 DPI

Professional print quality requires at least 300 dpi. Below 150 dpi prints appear visibly pixelated.

HIGH RESOLUTION vs. LOW RESOLUTION



Same physical size — more pixels = sharper image

HIGH RESOLUTION (300 dpi / ppi)

- More pixels per inch — finer detail
- Required for professional print (300 dpi+)
- Larger file size on disk
- Photos, brochures, posters, packaging
- Images stay sharp when enlarged

LOW RESOLUTION (72 dpi / ppi)

- Fewer pixels per inch — less detail
- Ideal for web, email, social media
- Smaller file size — faster loading
- Screen display, web banners, UI
- May appear pixelated if printed

IMAGE SIZE, FILE SIZE & RESIZING

Image Dimensions

Width × Height in pixels determines the total pixel count. E.g. 1920×1080 = ~2 megapixels.

File Size

More pixels = larger file. A 300 dpi image has ~17× more pixels than the same image at 72 dpi.

Resampling

Increasing resolution without adding real data (upsampling) blurs the image. Always photograph at the highest resolution needed.

Canvas vs Image Size

Image size = pixel dimensions. Canvas size = the working area. Enlarging the canvas adds blank space; reducing crops the image.

SCREEN RESOLUTIONS & ASPECT RATIOS

Standard (4:3)

800×600, 1024×768, 1280×960
Classic monitor format — now largely obsolete.

HD / Widescreen (16:9)

1280×720, 1920×1080, 2560×1440
Dominant format for modern monitors, TVs and video.

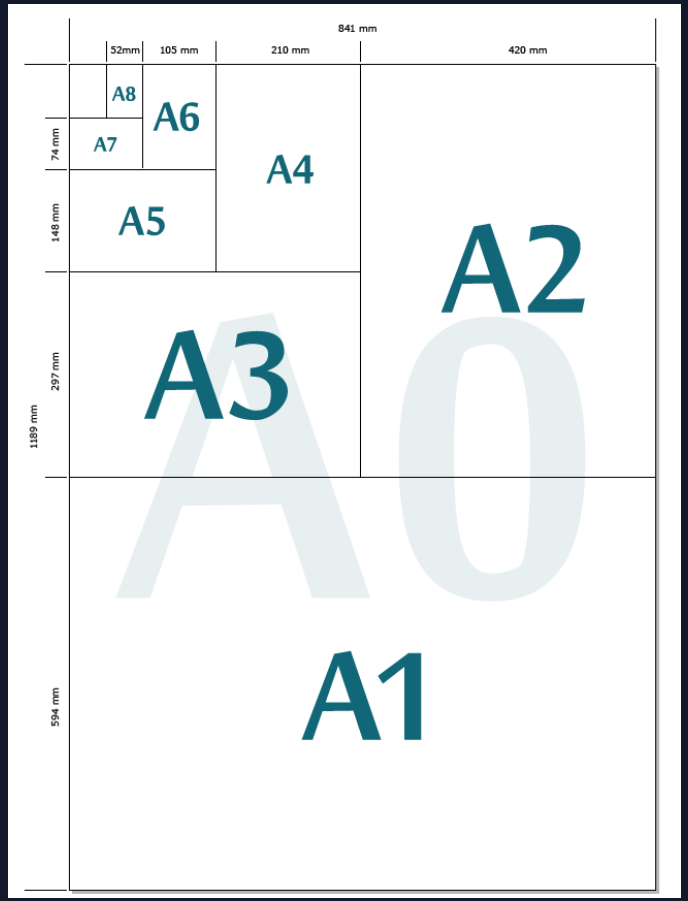
Widescreen (16:10)

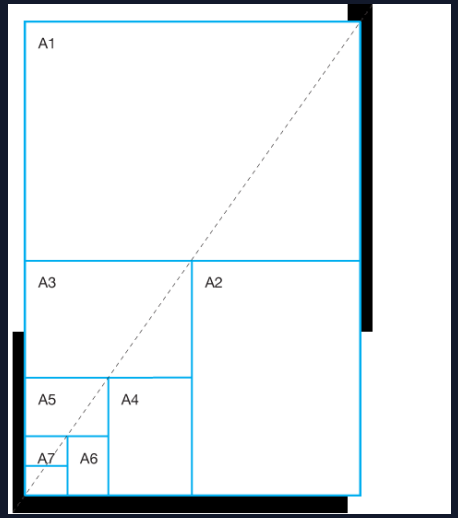
1280×800, 1920×1200
Common for laptops and professional displays.

4K Ultra HD (16:9)

3840×2160 — 4× the pixels of 1080p.
Used in cinema, video production, and high-end displays.

ISO PAPER SIZES — A SERIES

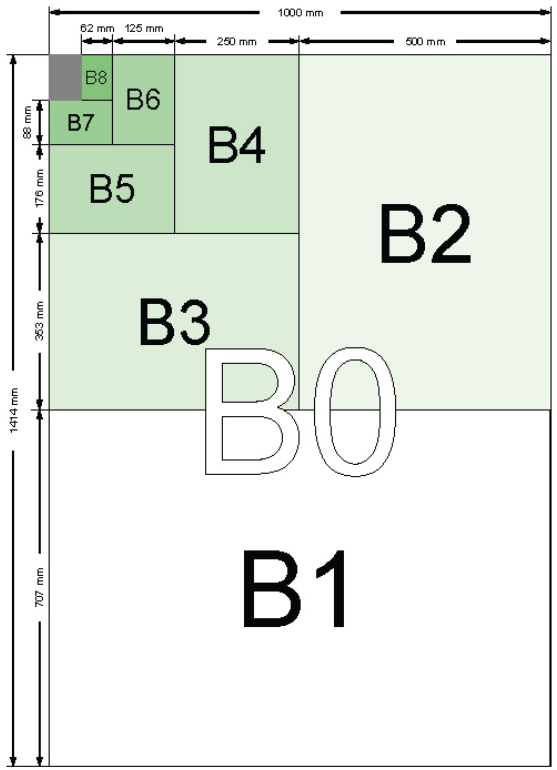




Size	Dimensions	Common Use
A0	841 × 1189 mm	Poster / large format
A1	594 × 841 mm	Technical drawings
A2	420 × 594 mm	Posters, charts
A3	297 × 420 mm	Drawings, tabloid
A4	210 × 297 mm	Standard letter/document
A5	148 × 210 mm	Notepads, booklets
A6	105 × 148 mm	Postcards

Each A size = half the area of the next larger size. All share the same √2 aspect ratios.

ISO PAPER SIZES — B SERIES

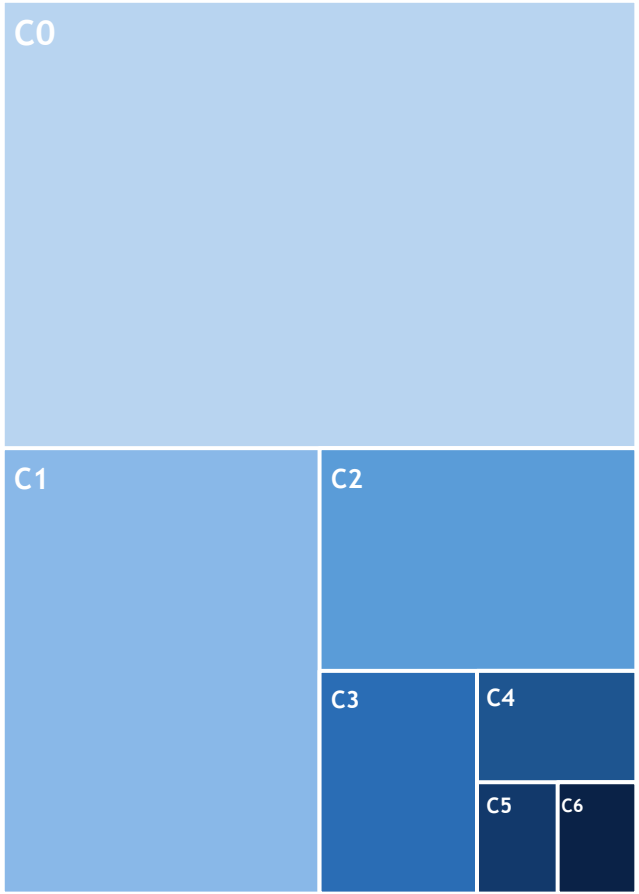


The B Series

B sizes fall between A sizes. Used primarily for books, passports, and posters where A sizes don't quite fit. B0 = 1000 × 1414 mm.

Size	Dimensions	Common Use
B0	1000 × 1414 mm	Largest poster format
B1	707 × 1000 mm	Poster, large signage
B2	500 × 707 mm	Poster, magazine spread
B3	353 × 500 mm	Posters, some packaging
B4	250 × 353 mm	Folders, some books
B5	176 × 250 mm	Books, magazines
B6	125 × 176 mm	Books, pocketbooks
B7	88 × 125 mm	Passport size
B8	62 × 88 mm	Playing cards

ISO PAPER SIZES — C SERIES



What is the C Series?

The ISO C series defines envelope sizes sized to hold A series sheets. C4 holds an unfolded A4; C5 holds A4 folded once; C6 holds A4 folded twice. C sizes are the geometric mean between A and B sizes of the same number.

Primary Use: Envelopes

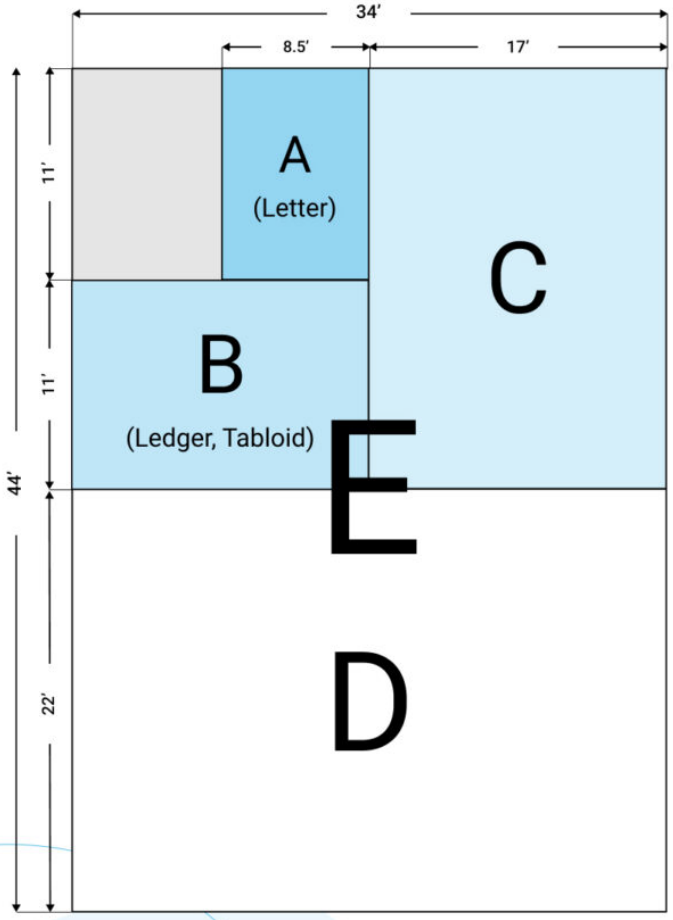
C series is almost exclusively used for envelopes and presentation folders. C4, C5 and C6 are the most common found in every office worldwide for mailing A4 documents.

C sizes nest inside each other - C4 envelope holds an unfolded A4 sheet

★ DL (Dimension Lengthwise) is not strictly ISO C but is the most widely used envelope worldwide - holds A4 folded into thirds.

SIZE	DIMENSIONS	HOLDS
C0	917 × 1297 mm	A0 flat
C1	648 × 917 mm	A1 flat
C2	458 × 648 mm	A2 flat / A1 folded
C3	324 × 458 mm	A3 flat / A2 folded
C4	229 × 324 mm	A4 flat ★ most common
C5	162 × 229 mm	A4 folded once
C6	114 × 162 mm	A4 folded twice
C7	81 × 114 mm	A4 folded 3×
DL	110 × 220 mm	A4 in thirds ★ standard

ANSI SERIES PAPER SIZES



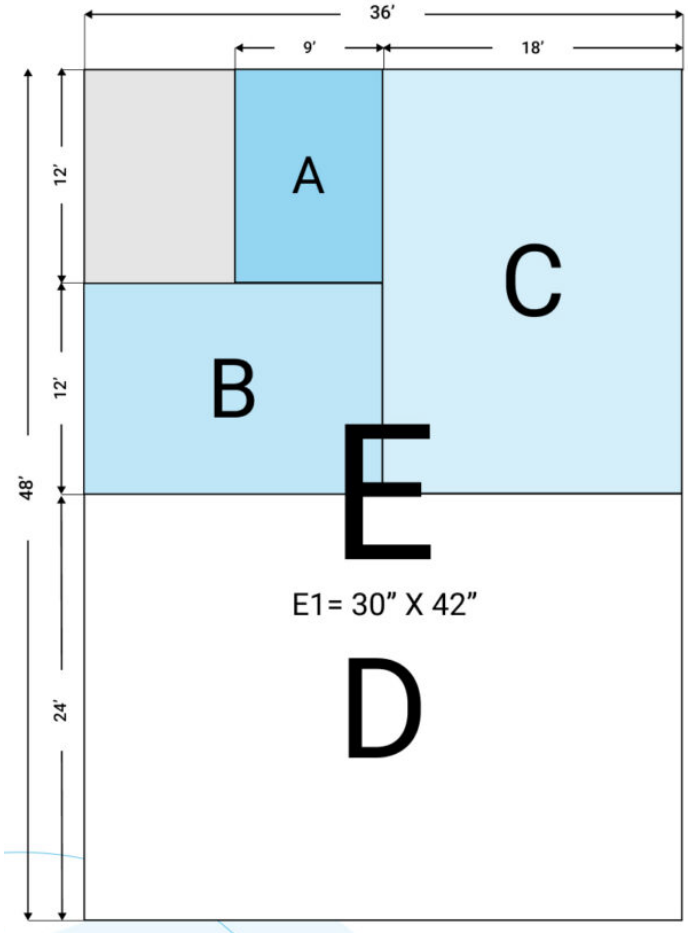
What is the ANSI Paper Series?

The ANSI series (American National Standards Institute) defines paper sizes used in the USA for engineering and technical documents. ANSI A is the familiar Letter size (8.5"×11"). Each larger size is exactly double the previous — the same √2 doubling principle as ISO A series, but using imperial inches.

Size & Name	Inches (W × H)	mm (W × H)	Common Use
A *Letter*	8.5" × 11"	216 × 279 mm	Office documents, letters, forms
B *Ledger / Tabloid*	11" × 17"	279 × 432 mm	Spreadsheets, small posters
C	17" × 22"	432 × 559 mm	Drawings, presentation boards
D	22" × 34"	559 × 864 mm	Engineering drawings, maps
E	34" × 44"	864 × 1118 mm	Large technical / construction plans

★ *Each ANSI size = double the area of the previous · ANSI A = ISO A4 equivalent (different dimensions) · USA imperial standard · Used for engineering & technical drawings*

ARCHITECTURAL PAPER SIZES (ANSI / ARCH SERIES)



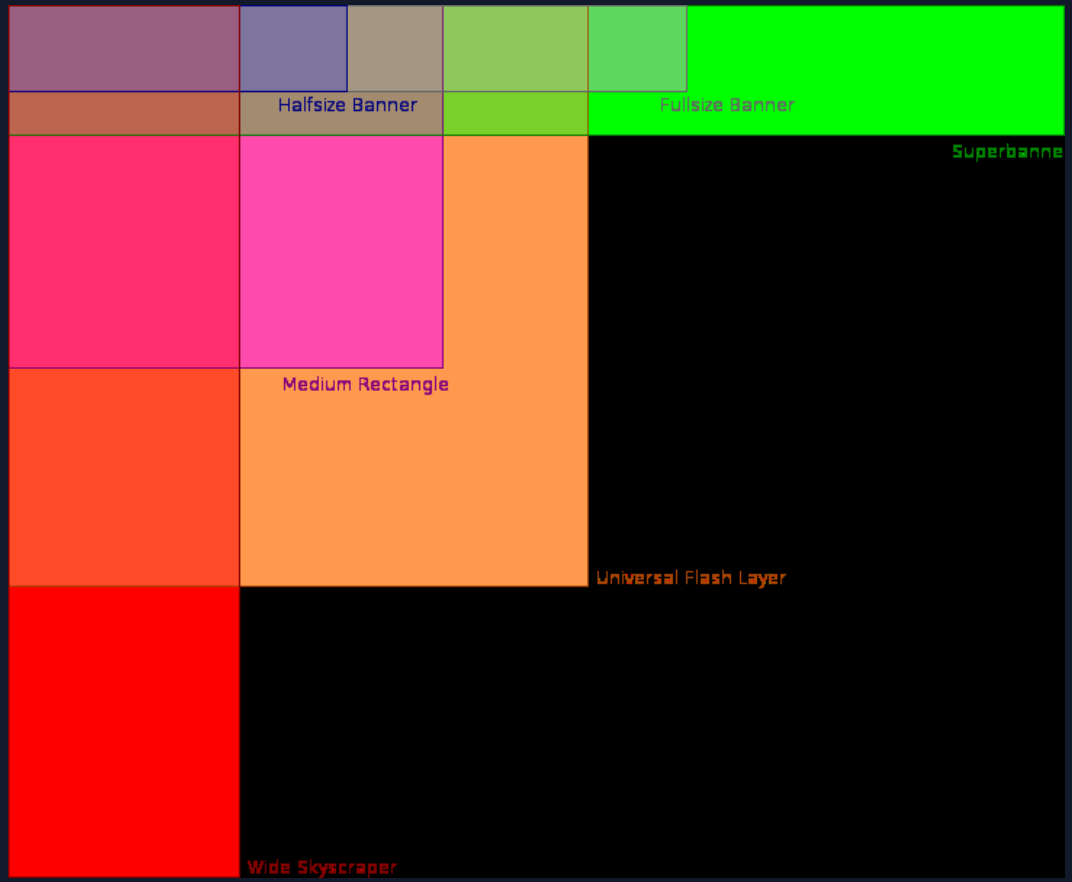
What are Architectural Paper Sizes?

Architectural (Arch) paper sizes are used in the USA for architectural drawings, blueprints, and engineering plans. Unlike ISO A sizes, Arch sizes use imperial measurements (inches) and have a 4:3 aspect ratio. They are standardised under ANSI/ASME Y14.1.

Size	Inches (W × H)	mm (W × H)	Common Use
A	9" × 12"	229 × 305 mm	Sketches, small drawings
B	12" × 18"	305 × 457 mm	Construction details
C	18" × 24"	457 × 610 mm	Site plans, presentations
D	24" × 36"	610 × 914 mm	Floor plans, elevations
E	36" × 48"	914 × 1219 mm	Large-scale blueprints
E1	30" × 42"	762 × 1067 mm	Alternative large format

★ *Each Arch size is exactly double the area of the previous size. · ANSI/ASME Y14.1 · USA imperial standard (inches) · 4:3 aspect ratio (except E1)*

WEB BANNER & AD SIZES



SIZE (px)	DESCRIPTION
728×90	Leaderboard — top/bottom of page
300×250	Medium Rectangle — most popular
160×600	Wide Skyscraper — sidebar
120×600	Skyscraper — narrow sidebar
468×60	Full Banner — standard banner
234×60	Half Banner
250×250	Square Pop-Up
180×150	Rectangle
120×90	Button 1
88×31	Micro Bar

KEY TAKEAWAYS

Pixels

The smallest unit of a digital image. More pixels = more detail and larger files.

PPI

Pixels Per Inch - the pixel density of a digital image or display. Screen standard: 72 ppi.

DPI

Dots Per Inch - the output density of a printer. Print standard: 300 dpi minimum.

Image Size

Measured in pixel dimensions (W × H). Changing resolution without resampling doesn't add detail.

Canvas vs Image

Canvas is the working area. Expanding canvas adds space; reducing it crops the image.

Paper Sizes

ISO A series: A4 (210×297mm) is standard. Each size is half the area of the previous.

Web Ad Sizes

Standardised pixel sizes for digital advertising: 728×90 leaderboard, 300×250 rectangle, etc.

Screen Res

HD: 1280×720, FHD: 1920×1080, 4K: 3840×2160. Aspect ratio 16:9 dominates modern displays.