CSCI-UA-4-005

Intro to Web Design + Computer Principles

Raster Graphics – Day 2

Professor Emily Zhao

M/W 12:30PM – 1:45PM

Agenda

- Midterm Format
- Raster Graphics Part 2
- Photoshop/GIMP Tutorial Part 2
- CSS Positioning
- Open Workshop

Midterm

Midterm

Date: Monday, October 23rd

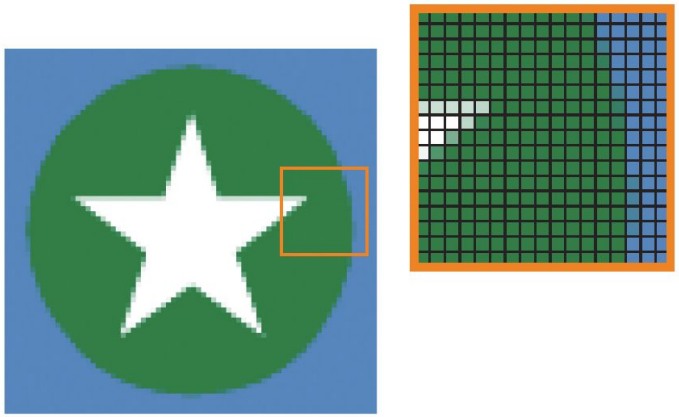
Format: Multiple Choice

Topics Covered: Computer Principles, The Internet, Unix, HTML, CSS, Web Graphics

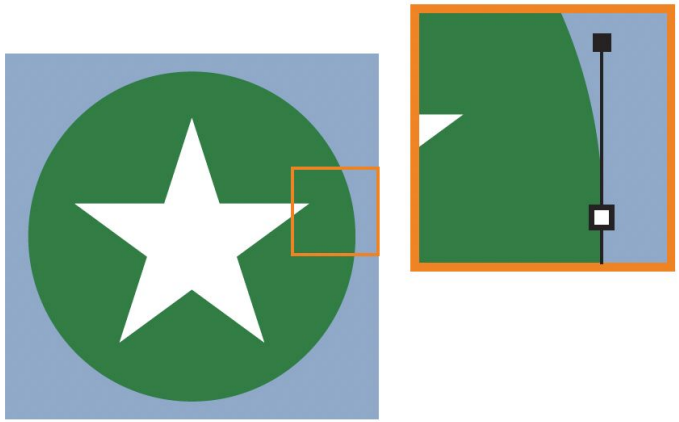
- Paper exam; no laptops/internet
- Open note (bring in whatever you need)
- 5-10 multiple choice questions per unit
- 25-35 multiple choice questions in reference to attached code

Raster Graphics

Raster vs Vector



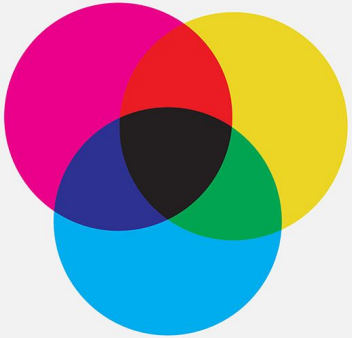
Bitmapped images are made up of a grid of variously colored pixels, like a mosaic.



Vector images use mathematical equations to define shapes.

FOR PRINT

CMYK



CYAN

MAGENTA

YELLOW

"KEY" BLACK

FILE FORMATS

EPS

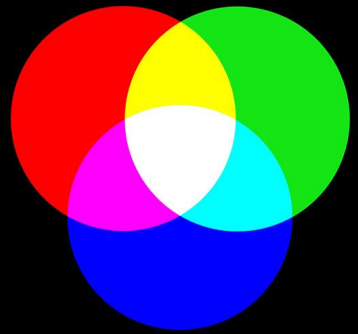
AI

PDF

We Make Design Work

FOR SCREENS

RGB



RED

GREEN

BLUE

FILE FORMATS

JPG

PNG

PSD

www.thevisualpro.com

Web Formats

JPEG	“Joint Photographic Experts Group”
PNG	“Portable Network Graphics”
GIF	“Graphic Interchange Format”
WebP	Newer web image format that is gaining solid browser support
AVIF	New, open-source image format for still and animated image

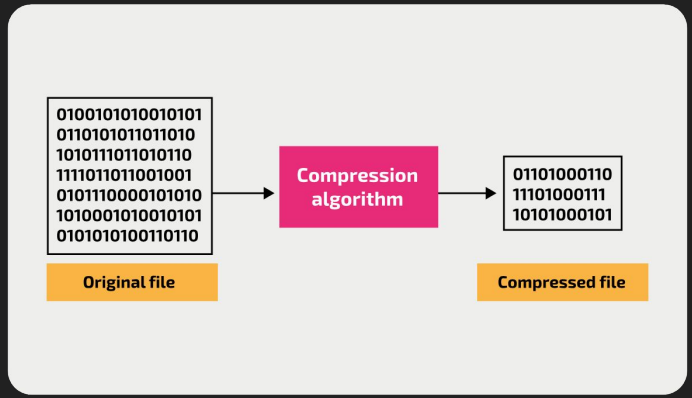
size | **transparency** | **compression** | **browser support**

File Compression

- Compression is when algorithms minimize your file size
- Different file types use different compression algorithms

Lossy: some data is discarded and approximated resulting in smaller file size

Lossless: original data is reconstructed resulting in a more accurate file with a larger file size



File Size

File size is determined by...

- Bit depth (the number of bits used to indicate the color of a single pixel)
- Image dimensions
- Image resolution
- File type

Bits + Bytes

1 Bit	=	Binary Digit
1 Byte	=	8 Bits
1 Kilobyte (KB)	=	1024 Bytes
1 Megabyte (MB)	=	1024 KB
1 Gigabyte (GB)	=	1024 MB
1 Terabyte (TB)	=	1024 BG

* Standard images for the web should be as small as possible (~5-500KB)
* Images can get up to several hundred megabytes in size

Images

PNG	2 – 4 kB
GIF	6 – 8 kB
JPG	9 – 12 kB

Documents

DOCX	4 – 8 kB
PDF	18 – 20 kB

Media Files

eBook	1 – 5 MB
MP3 song	3 – 4 MB
DVD Movie	4 GB
HD Movie	5 – 8 GB
Blu-Ray	20 – 25 GB

JPEG

Joint Photographic Experts Group

- Great for photographs
- Capable of displaying millions of colors in RGB space
  - 24 bit color (RGB all defined with 8 bits of information)
- Lossy compression

👍 Works well with gradient and blended colors

👎 Struggles with flat colors and hard edges

PNG

Portable Network Graphics

- Newest image format (meant to replace GIF)
- Preserves transparency
- Lossless compression
- 24-bit (PNG-24): millions of colors
- 8 bit (PNG-8): 256

👍 Good for flat color (logos, line art, icons)

👎 Works for photos but won’t be saved as efficiently, resulting in larger files sizes

GIF

Graphic Information Format

- First image format supported by web browsers
- Supports animation
- Preserves transparency
- Lossless compression
- 8-bit: only 256 colors

👍 Smaller file size, great for simple graphics

👎 PNG can do everything the GIF can and better (except animation)

WebP

Web Picture Format

- Developed by Google intended as a replacement for JPEG, PNG, and GIF file formats.
- Preserves animations and transparency
- Can produce smaller file sizes than JPEG
- Supports both lossless and lossy compression

👍 “the Swiss Army knife of image formats”

👎 Not well supported (yet)

TABLE 23-1. Choosing the best bitmapped (raster) file format

If your image...	use...	because...
Is graphical, with flat colors	8-bit PNG or GIF	PNG and GIF excel at compressing flat color.
Is a photograph or contains graduated color	JPEG	JPEG compression works best on images with blended colors. Because it is lossy, it generally results in smaller file sizes than 24-bit PNG.
Is a combination of flat and photographic imagery	8-bit PNG or GIF	Indexed color formats are best at preserving and compressing flat color areas. The pixelation (dithering) that appears in the photographic areas as a result of reducing to a palette is usually not problematic.
Requires transparency	GIF or PNG-8	Both GIF and PNG allow on/off transparency in images.
Requires multiple levels of transparency	PNG-24 or PNG-8	Only PNG supports multiple levels of transparency. PNG-24s with alpha transparency have a much larger file size, but it is easier to find tools to create them. WebP also supports alpha transparency, and may be a better option once it is better supported.
Requires animation	GIF	GIF is the only supported format that can contain animation frames. APNG and WebP may be better options in the future.

Raster Graphic Editors

Photoshop

Gimp

Affinity Photo

Assignment 4 – Walkthrough

Non-Destructive vs Destructive Editing Techniques

Non-Destructive Editing (NDE) is a method of editing in Photoshop that allows you to make changes to an image without losing the original image information.

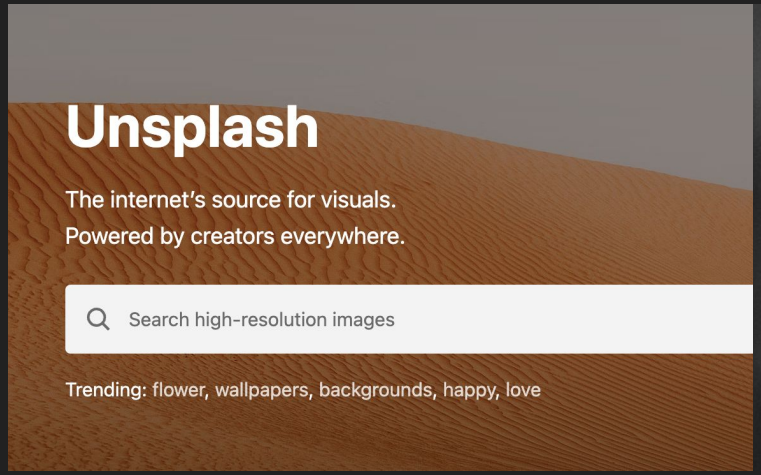
For example: using separate layers for text and brush strokes, layer masks, blending modes, layer styles, smart objects!

Destructive Editing is a method of editing in Photoshop where you are permanently changing the original image.

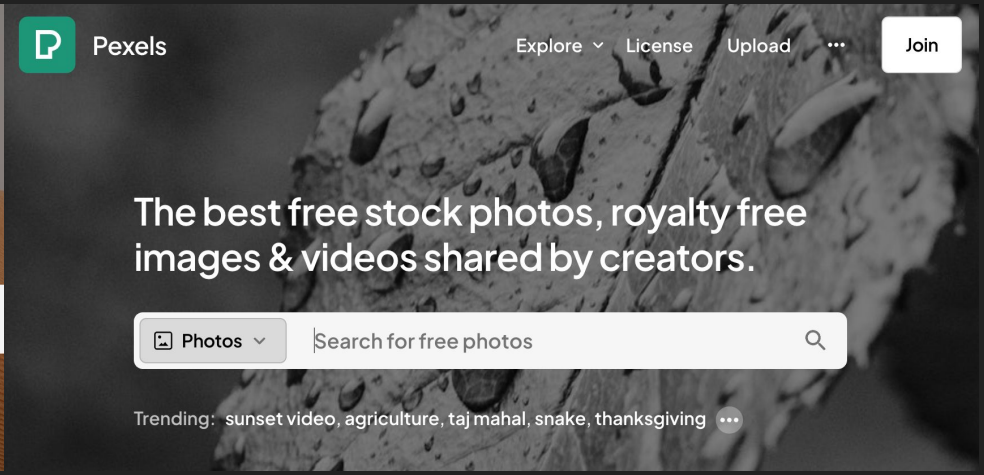
For example: merging layers, adding filters, deleting pixels with an eraser.

You can still ‘undo’ while you are actively editing the image and have the project open. However, once you save it, there is no going back!

Where to get your images



unsplash.com

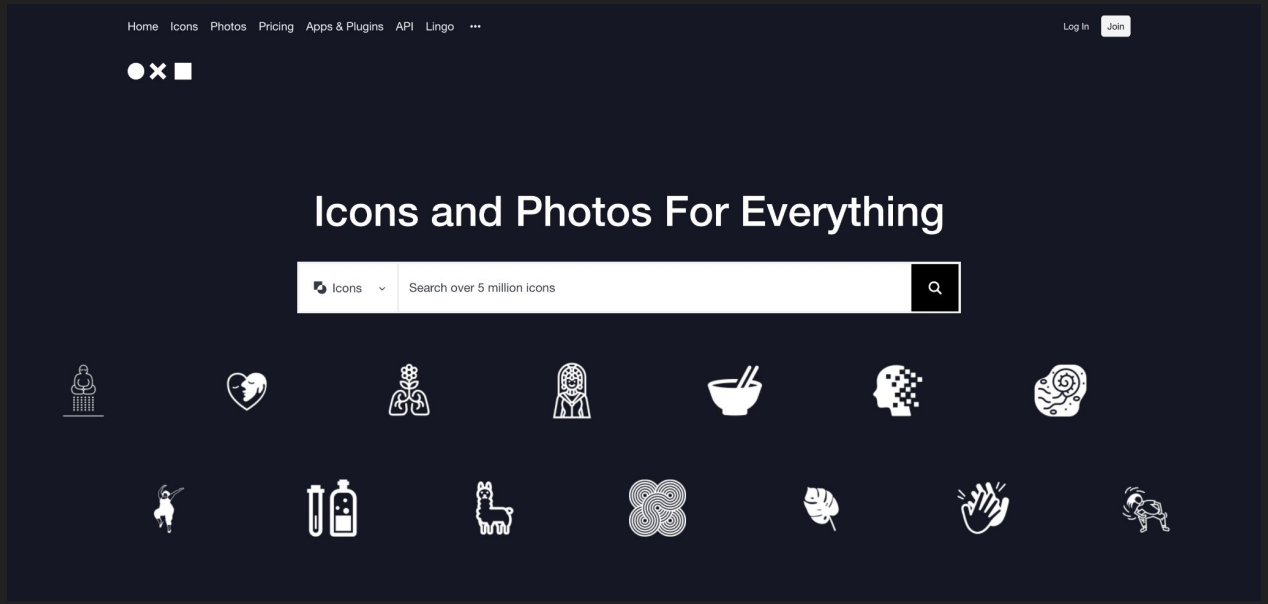


pexels.com

Where to get your images

[Wikipedia Commons]

Clip art



[The Noun Project]