

Imaging Made Easy

Imaging Essentials
Acquisition, Manipulation,
Annotation and Output

with
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Introduction to Digital Images

Digital images defined
Work flow
Acquisition devices
Editing for specific uses
Compositing & annotation
Output devices



images defined

Object type	Characteristics	Examples	Usual file types
 Raster objects	<ul style="list-style-type: none"> •Pixel based •Described in terms of resolution (dpi) •aka bitmap •Cannot grab object & stretch to resize larger 	<ul style="list-style-type: none"> •Photographs •All images from Scanners •Microscopes cameras •All .tif, .jpg & .gif files 	<ul style="list-style-type: none"> •.tif •.jpg •.gif
 Vector objects	<ul style="list-style-type: none"> •No pixels / no resolution •Mathematical algorithm •OK to grab object & stretch to resize larger 	<ul style="list-style-type: none"> •Illustrations •Text objects •Drawing tool objects •Never .tif, .jpg or .gif file type 	<ul style="list-style-type: none"> •.eps •.ps •.pdf •.ppt .ai, .cnv
 Rasters that were vectors	<ul style="list-style-type: none"> •Pixel based •Described in dpi •aka bitmap •Cannot grab object & stretch to resize larger 	<ul style="list-style-type: none"> •Scanned illustrations •Illustrations that have been 'rasterized' •All .tif, .jpg & .gif files 	<ul style="list-style-type: none"> Often •.tif •.jpg •.gif Occasionally •.eps

Work Flow

Acquire or create images
Determine output requirements
Edit images with Photoshop
Crop
Image size and resolution
Adjust contrast
Composite and annotate with PowerPoint
Output



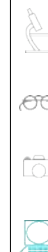
Work Flow: Acquisition

Acquire or create high resolution master images
Flatbed scanners
Slide scanners
Digital cameras
Microscopes and other imaging devices



Work Flow: Acquisition

Save high resolution, uncompressed master files safely away
Edit only copies of these master files



Work Flow: Output Requirements



The bad news
One size does NOT fit all!

Work Flow: Output Requirements

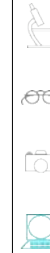


Before editing images determine the output device requirements

Find this out by reviewing:

- Resolution, File Type & Color Mode Charts in *Imaging Essentials* guide
- Journal or grant submission guidelines
- Off-site press file requirements

Work Flow: Output Requirements



Before editing images determine the output device requirements

Know the following:

- Image Size
- Image Resolution
- Color Mode
- File Format

Art Work Type / Output Device	Photo Images Bitmap Images Raster Images (with no text or vector objects within)	Raster images that contain Line Art Illustrations Vector Objects Cartoons Text
PowerPoint On-screen Presentation LCD Data Projector Computer Monitor/Display Web Site <small>Physical Dimensions of Presentation: 7.5" x 10" (approximate physical dimension of projector or monitor)</small>	100 dpi	200 dpi
Laser Printer (Laserjets & LaserWriters) <small>Printer Resolution</small>	200 dpi	300-600 dpi
Photo Quality Inkjet <small>Printable Area = as low as 8" x 11" (photo paper)</small>	150 dpi (plain paper) 180 or 240 or 320 dpi	300-600 dpi
Photo-Quality Printer (i.e.: Fujix, dye sublimation printers) <small>Printable Area = 8" x 10" or 8" x 11"</small>	300-400 dpi (usually 320 dpi)	600-1200 dpi
Poster Printer <small>Printable Area = 8" x 10" or 8" x 11" or 11" x 17"</small>	125-300 dpi start at 125dpi	300 dpi
Slide Maker Film Recorder <small>Printable Area = 4096 x 2710 pixels or with PowerPoint 7.5" x 11.25"</small>	300 dpi	If inserting into PowerPoint: 225 dpi

If imaging directly from Canvas or Photoshop the pixel dimensions should be 4096 x 2711
If from image created from other applications, the film recorder will accept the image for the full size & without scaling

Work Flow: Image Editing



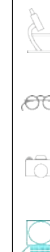
Get organized- create a project folder

- Copies of the master images for editing
- Composite document

Additional tips

- After editing your images, it is useful to give the file an informative name like gel_2x2_125dpi.tif
- Include .extension in file name for cross-platform compatibility

Work Flow: Image Editing



Photoshop, Canvas, GraphicConverter

- Crop
- Adjust brightness & contrast
- Image size
- Color mode
- File type
- Resolution

Versatility and Compatibility

 Save your edited images in file formats that are versatile for cross-platform and cross-application use



Best:

- .jpg or .tif for photos and scans
- .jpg or .gif for bitmapped illustrations and cartoons



Work Flow: Compositing and Annotating



PowerPoint



- Assemble single or multiple images to create a figure
- Add titles, captions and other annotations



Work Flow: Output



PowerPoint is infinitely versatile



- Prints to any output device
- Creates files that maintains image integrity (vectors stay vectors)
 - .eps
 - .ps
 - .pdf
- Creates common bitmap formats
 - .jpg
 - .tif



Work Flow: Output



PowerPoint output options

- Given the choice, choose better quality file formats that keep vector objects looking sharp



.eps
.ps
.pdf

- Even high-resolution bitmap formats will rasterize annotations so they appear 'jaggedy'



.jpg
.tif



resources



Brown Bag Handouts	countway.harvard.edu/imaging/handouts.shtml
Other Imaging Guides	countway.harvard.edu/imaging/guides.shtml
PowerPoint FAQ	www.rdpslides.com/pptfaq/
PowerPoint Tips	www.powerpointbackgrounds.com/powerpointtips.htm
More PowerPoint Tips	www.echosvoice.com/
PowerPoint classes at HMS	www.hms.harvard.edu/it/training/schedule.html
PowerPoint classes at Harvard University	atwork.harvard.edu/training/ctd/



Questions? Comments?



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