

REPAIRING PHOTOS AND DOCUMENTS WITH GIMP

Gimp		
	Introduction	3
	Setting up GIMP	4
	Preferences	4
FILE		
	File Types	5
	Opening Files	5
	Saving Files	5
	Exporting Files	5
TOOLS OPTIONS		6
SELECTION TOOLS		7
PAINTING TOOLS		9
	Brush Options	9
	Clone and Healing Tool	12
	Heal Selection (Resyntesizing)	12
	Blur/Sharpen	12
	Smudge	12
	Dodge/Burn	12
	Color Picker	13
	Text	13
COLORS		
	Red Eye	14
	Fixing Faded Photos	14
	Color Adjustments	14
TRANSFORMATION		15
	Straighten & Rotate	15
	Scale	15
	Perspective Correction	15
	Cropping	15
LAYERS		
	Introduction to Layers	16
	Layer Masks	17
	Layer Modes	18

SHARPENING

Sharpen (Unsharp Mask)	18
High Pass	18
Sharpen Wavelet-Decompose Plugin	19
G'IMC Qt [Octave] Plugin	19

DENOISE

Simple Denoise Method	20
Two step method using HSL & G'MIC	20

COPY AND PASTE	21
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TROUBLESHOOTING	21
------------------------	-----------

REPAIRING PHOTOS AND DOCUMENTS WITH GIMP

Adding photos to your family history documentation makes them much more interesting. Most of the time you will be scanning old photos. When scanning photos make sure the flat bed is dust free. Old photos produce a lot of dust and that dust will show up in your scans, so make sure to keep your glass dust free. Another tip, is even though the ancient photo will most likely be in black and white, always scan your photos in color as you will be able to tease out more details.

When doing family history you may come across images that are less than ideal. The image may be crooked, faded, or damaged image. In order to fix these issues you will need some sort of photo editing software, with more options than MS Photos has to offer.

We are using GIMP because it is the most powerful free alternative to PhotoShop.

GIMP has a very busy interface because it does so many things. This booklet covers the some of the basic concepts to get started with photo restoration. The videos have been carefully chosen for pace with the 55+ brain in mind.

GIMP – GNU Image Manipulation Program

There are still some developers who write open source, and then support their products with ads on their site and solicit donations if you find their product useful. You are probably familiar with OpenOffice or LibreOffice, which are open source alternatives to Microsoft Office. Likewise, GIMP is an open source alternative to Adobe Photoshop. Adobe is the top of the line photo editing software. Adobe has many products that manipulate photos. Photoshop Elements retails for 119, PhotoShop CC costs up to \$20 a month. GIMP is a powerful photo editing program that you can download and use for free. If you find the program useful, you can make a donation to the developer through the website.

Both GIMP and Adobe Photoshop Elements have an intimidating interface, but the processes I have used for photo repair on each piece of software I have used has been about the same degree of difficulty.

<https://www.gimp.org/>

SETTING UP GIMP ON WINDOWS 10 or 11.

With any open source program you need to make sure you are getting it from the correct website, and beware of ads that may masquerade as the official download. The base GIMP application can be found at <https://www.gimp.org/>

ARTICLE Gimp Add Ons <https://www.makeuseof.com/tag/install-gimp-plugins/>

In the lab we have these GIMP and these plugins that were recommended by Make Use Of:

- GIMP 2.10.8
- G'mic (plug-in with great special effects)
- GIMP Scripts Bundle
- Duplicate to Another Image
- NIK Collection
- Reynthesize (a powerful healing addon, I could only find the Windows version in a blog post)
- Wavelet Decompose (powerful add on for working with skin tones)
- Darkroom (for use with .RAW files)
- Hugin Panoramas (windows 64 only)

Right click on an image from the file explorer.

Select **Open With**

Choose **Set Default**

Choose **Other**

Navigate to “[C:\Program Files\GIMP 2\2.10\bin\GIMP 2.10](#)”

Uncheck **Always Open With** unless you want this to really be the default program.

Repeat these steps for JPG, BMP, PNG, GIF...

PREFERENCES

Initial setup comes with a dark theme and dark icons, and for most of us will need color icons to actually differentiate the tools. First thing to do is visit the **Edit** → **Preferences** menu and change the **Interface** settings :

Theme	we are using System Theme
Theme Icon	we are using Color Icons
Toolbox	uncheck Use tool groups (not present in 2.10.8, but is present in later versions and makes icons harder to find.)

FILES

File types

GIMP handles a large variety of file formats, but as a beginner, for the most part we will be limiting our discussion to XCF, JPG and PNG files.

- **XCF**, short for **eXperimental Computing Facility**, is the native image format of the GIMP image-editing program. **XCF** files are project files. **XCFs** save all of the data the program handles related to the image, including, among others, each layer, the current selection, channels, transparency, paths and guides. This format is used inside of GIMP and is not suitable to share your finished work, instead you will be exporting to JPG or PNG.
- **JPG – JPEG**, short for **J**oint **P**hotography **E**xperts **G**roup, is a format that is the most common image format used by digital cameras and other photographic image capture devices. It is the most common format for storing and transmitting photographic images on the World Wide Web. It is a “lossy” format, which means that every time you re-save the image, a little of the quality is lost.
- **PNG – Portable Network Graphics** that supports lossless data compression. The PNG format was developed for transferring images on the Internet, not for professional-quality print graphics. Export to PNG if you need to preserve transparency in a picture.

Opening a file in GIMP

The **File** → **Open** dialog box in GIMP is quite different than anything I have ever seen on a Windows PC. Watch the video for an excellent demo on the ways to open a file in GIMP.

VIDEO How to open an Image 5:07 <https://www.youtube.com/watch?v=Oiyx52f6sp0>

Saving a file

The **Save** and **Save As** dialog box, allows you to save an XCF file. If the file has already been named, the **Save** feature will overwrite the previous version without a warning message, otherwise this will bring up the **Save As** dialog.. Use **Save As** to change the name.

Exporting a file

The **Export** and **Export As** are the options you need to create a picture suitable for sharing or using in a document. To select the JPG or PNG format, merely change the file extension when you specify the file name. If the file was an import, the **Export** option will be replaced with an **Overwrite** option.

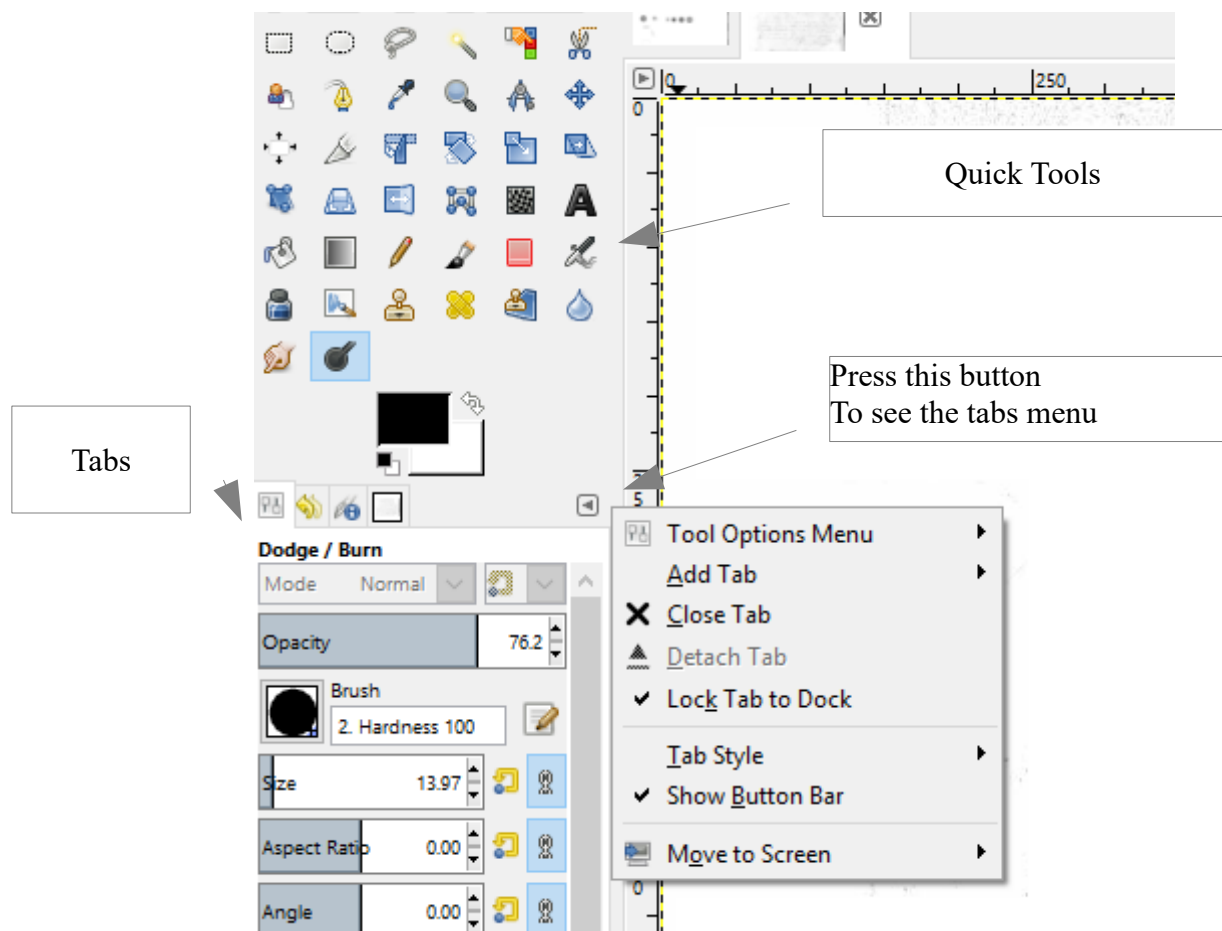
Dockable Dialog Boxes

When you first installed GIMP, it was configured to be in Single-Window Mode. There are several tool docks on the edges, each with multiple tabs. But GIMP can be easily customized. The Docks and tabs can be torn off, made to float and can be docked and closed individually. This is really great if you are a power user, not so great if you use the software once in a blue moon.

The docks can easily be restored by going to the Windows menu, (see troubleshooting) but the tabs may be missing or moved.

TOOLS OPTION TAB

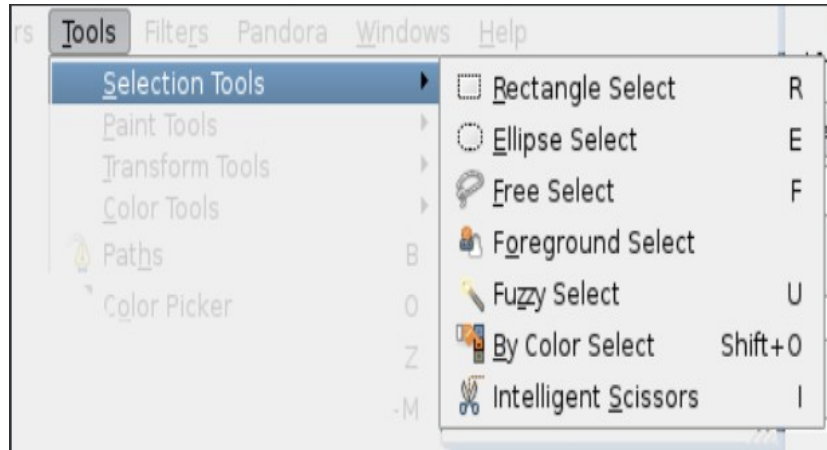
The Tools Option Tab is one of the most important dialog boxes. You need to view it any time you change tools. It is quite easily dislodged from its dock and closed. While it is easy to get back, I'd suggest beginners lock the Tools Option menu in place so that it's always the first tab under the quick tools area.



SELECTION TOOLS

Selection tools are designed to select regions from the active layer so you can work on them without affecting the unselected areas.

In order to make changes, the area must be selected. You can use the selection to limit the areas that are changed by the various painting tools BucketFill, Gradient, Pencil, Paintbrush, Eraser, Airbrush, Ink, Clone, Heal, Perspective Clone, Blur/Sharpen, Smudge, dodge /Burn)



In addition there are more selection tools from the **Select** menu at the top of the screen.

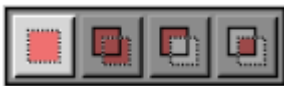
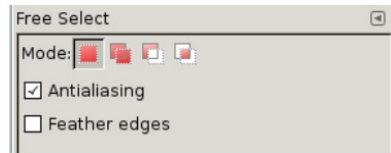
Select

Select All	Ctrl+A
Select None	Shift + Ctrl + A
Invert Selection	Ctrl + I

GIMP offers advanced users a lot of great selection features by using the modifier keys (combinations of ALT, CTRL, Shift) with the mouse and a lot of keyboard shortcuts. For now we are sticking with the settings we can choose on the screen, but as you do become more proficient, do visit the GIMP help pages to see these advanced features.

Selection Mode

The selection mode on the Tools Option tab determines the way that the selection you create is combined with any pre-existing selection. Note that the functions performed by these buttons can be duplicated using modifier keys, as described above. For the most part, advanced users use the modifier keys; novice users find the mode buttons easier.



Replace mode will cause any existing selection to be destroyed or replaced when the new selection is created.



Add mode will cause the new selection to be added to any existing selection regions.



Subtract mode will remove the new selection area from any existing selection regions.



Intersection mode will make a new selection from the area where the existing selection region and the new selection region overlap.

Antialiasing

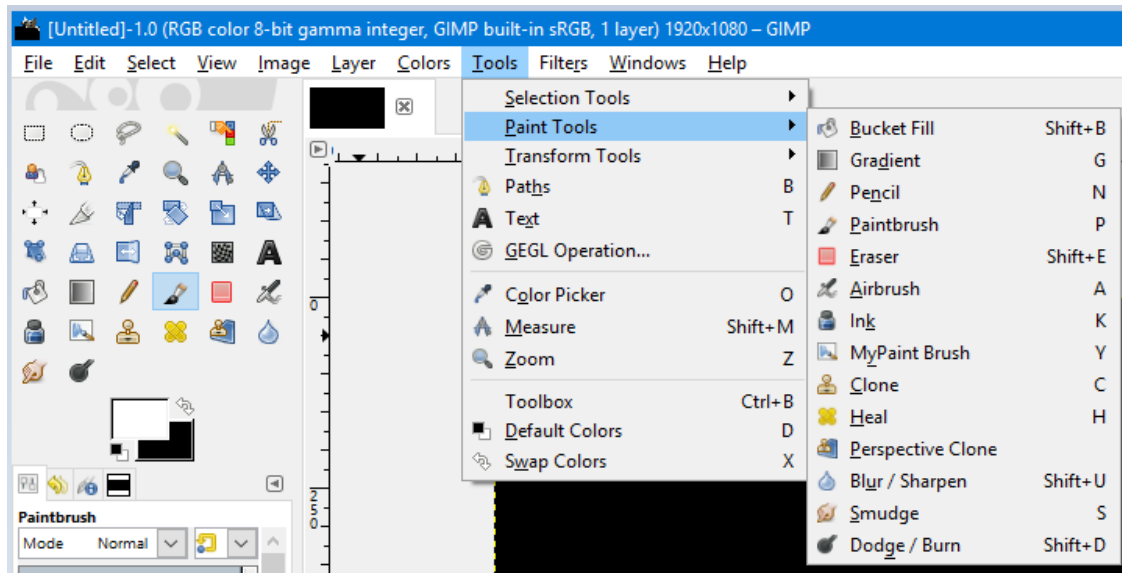
This option only affects some selection tools: it causes the boundary of the selection to be drawn more smoothly.

Feather Edges

This options allows the boundary of the selection to be blurred, so that points near the boundary are only partially selected.

VIDEO Selection Tool boy on the beach 3:23: <https://www.youtube.com/watch?v=Ufdt11re3oM>

PAINTING TOOLS



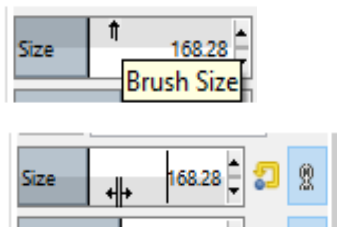
There are fourteen painting tools included in GIMP. All the paint tools except the Bucket Fill and Gradient have a brush size in the Tool Options. For photo restoration, the clone tool, the heal tool, the blur tool, the dodge tool will be the most useful.

BRUSHES OPTIONS

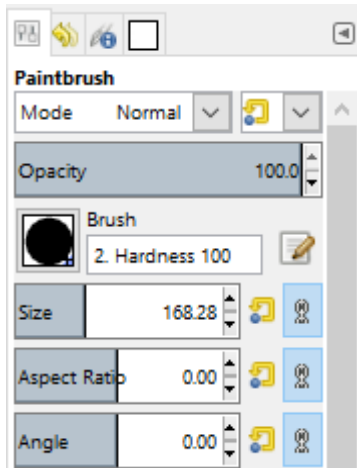
You'll be using sliders a lot in GIMP. These work differently than any other slider I have ever encountered. Placement of your pointer is very important when using these sliders. If you drag the slider to adjust the value, the speed that the slider slides will depend on if you are in the upper or lower half of the slider.

TIP SLIDERS TIP

Position mouse in the upper portion of the slider for fast adjustment
In the lower portion for slower slider.



MODE



Many brushes have a mode drop-down menu available. I haven't been able to find a comprehensive list of what these modes are used for, only a few of the modes were shown in troubleshooting guides, as to why the tools were not working as advertised.

OPACITY

The Opacity slider indicates how sheer or opaque the brush is going to be painting. Even at full opacity some of the tools will be slightly translucent. If you wanted to paint with nothing showing through choose the right painting tool. Ink will be opaque, while the paintbrush will be translucent.

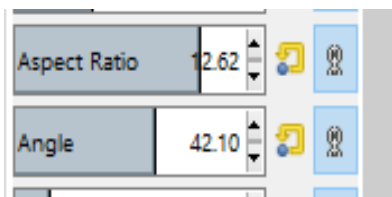
SIZE

As the name implies, Size allows you to control the size of the area being painted.

Quick tip: instead of moving your mouse over to the tools Option tab, use the brackets [and] from the keyboard to get the brush to resize to fit in the area. This method lets you resize brush without having to guess at the size.

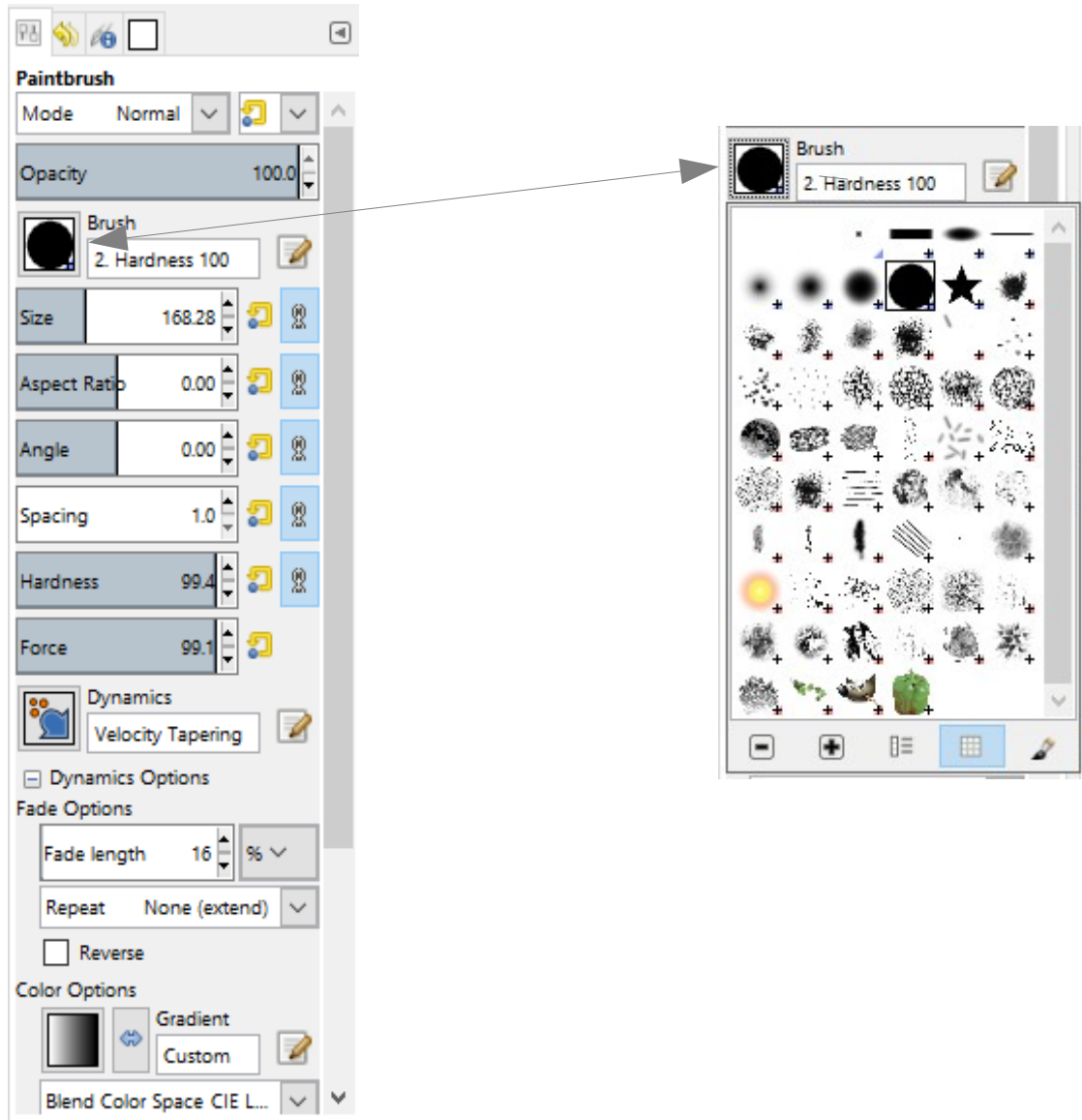
ASPECT RATIO and ANGLE

Changing an Aspect Ratio and an angle together make a big difference in a round brush. The circle had an aspect ratio of 0. When we changed it to 12.62 it flattened. When we change the angle to 42.10 it turned on its side.



GIMP 2.10.8

If you click on the brush icon it will show you a variety of standard brushes. The 4 round brushes shown here on the second row are the most common. They vary in hardness. Use a softer brush to make the painting blend better.



MY PAINT BRUSH – Advanced Topic not covered in class.

This “**My Paintbrush**” tool is an advanced tool. You can make your own custom brushes or load pre-made brushes.

VIDEO My Paintbrush 3:21 <https://www.youtube.com/watch?v=n77LssXpq14>

ARTICLE Brush Add Ons <https://www.makeuseof.com/tag/install-gimp-brushes/>



CLONE & HEALING

The clone and healing tools both have a source and a target. Set the source by hovering over a location and then press the CTRL key on your keyboard and click the left mouse button. The Healing tool copies and blends, while the Clone tool just copies pixels.

VIDEO: Clone man out of Dog photo 3:33 <https://www.youtube.com/watch?v=QeP-TvXDDl4>

VIDEO: Cloning and Healing 6:53 https://www.youtube.com/watch?v=1_QgEa9SiBU

HEALING A SELECTION (RESYNTHESIZER)

Resynthesizer is a GIMP plugin that automates removing an object from a picture. We have the resynthesizer plug-in installed in the lab. Select the object to be removed, including a little bit of the area that you want to be copied. Then go to the **Filters->Enhance->Heal Selection**.

VIDEO: Resynthesizer 10:07 <https://www.youtube.com/watch?v=J61ExqvNcBQ>

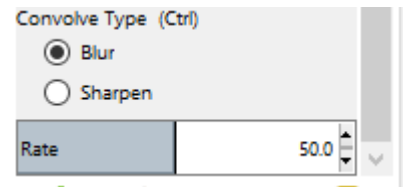


BLUR SHARPEN

Use blur to blend colors. Use blur to decrease the difference between colors. Sharpen is supposed to increase the difference between colors. The tool can be toggled from blur to sharpen.

VIDEO: Smudge, Blur, Dodge Bug on a leaf

https://youtu.be/x1VJIZcWdxk?si=ER_XQaxSVTIf7k0O



SMUDGE

Blurring with direction, more or less a smear.

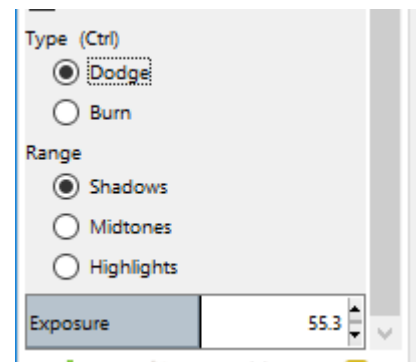
VIDEO: Smudge



DODGE/BURN(Lighten/Darken)

Scroll to the bottom of the dodge/burn tools options to see the controls that apply. The dodge tool works on a specific range of tones, dark, mid, or light. It lightens in Dodge mode, it darkens in burn mode.

VIDEO: Dodge Burn 3:38 <https://youtu.be/N7m0HcpxXOY>

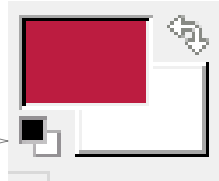




COLOR TOOL

Just about every program you use to create content has a color tool. The GIMP color tool shows you the current foreground and background. You can click on either the foreground color to change the color. Unlike some of the simpler color sectors you may see in other programs, this color tool allows you to select any of the 16.7 million colors.

The small icon
in the lower left changes
to black on white.



The small icon in the upper right will swap foreground and background.



COLOR PICKER

The color picker takes the guess work out of color selection by just choosing a color from a specific pixel or the average color of a group of pixels.

VIDEO: Color Picker 3.19 <https://youtu.be/p7oyUekkrVo?si=XQqP96GQFVKk5FKl>



TEXT

Adding names to photos can be very helpful in identifying photos, and can also be easily removed from a your final product.

VIDEO: Text for Beginners 5:29 <https://www.youtube.com/watch?v=LoPLBbNeedo>

COLORS

RED EYE REMOVAL

Red eye in photos is easily corrected. This option is found on the Filter Menu.
Filter -> Enhance -> Red Eye Removal

VIDEO: Red Eye Removal 4:17 <https://youtu.be/wzcoahp1UjA>

FADED PHOTOS

Badly faded photos still carry a surprising amount of data. The best tool to fix a faded photo color levels tool. Open the faded photo in GIMP and from the **Colors** menu and select **Levels** and then click on the **Auto Input Level** button.

VIDEO: Auto Levels 4:08 <https://www.youtube.com/watch?v=ZhyvW-oa3Jk>

In another, we see how to repair a partially faded picture using lightness and contrast.

VIDEO: Partial Faded Portion 12:15 <https://www.youtube.com/watch?v=eeiETD0VVpQ>

OTHER COLOR ADJUSTMENTS

Gimp offers many other color correction tools, you can adjust levels, curves, exposure, hue, color balance, color saturation, there are many Auto settings like Equalize, White Balance, Stretch Contrast, Color Enhance that can improve your photos. Each photo problem needs a custom solution. Use some trial and error to see what changes you need.

RECOMMENDED VIDEOS ON COLOR CORRECTION

VIDEO Girl in Yellow Hat 9:48 <https://www.youtube.com/watch?v=DaeHrNt-Hrs>

VIDEO Basic Color Settings 9:31 <https://www.youtube.com/watch?v=hUXc-fOovak>

VIDEO Advanced Colors 22:49 <https://www.youtube.com/watch?v=TiavEWDVQGE>

VIDEO Color Curves 13:57 <https://www.youtube.com/watch?v=JDY6voINTso>

VIDEO Luminosity to fix dark objects 22:11 <https://www.youtube.com/watch?v=3Izcmh1ZB4U>

TRANSFORMATION TOOLS

On both the **Image** and **Layer** menus you have **Transform** menus that let you flip images horizontally, vertically, rotate them 90° clockwise, 90° counter-clockwise, or 180°, but just about every image handling program can do that. Photo programs let you do more interesting moves.



Rotation Tool to straighten a photo.

Drag a horizontal guideline down from the top, or a vertical guideline from the left, then select the rotation tool. Drag the image until the item is straight. Adjust the clipping setting in the tools option box to determine what to do with the corners that overhang the the layer boundaries/ Then press the Rotate button on the dialog box.

VIDEO: Rotation with GIMP 9:14 <https://youtu.be/sLAR7iotcIw>



Perspective Correction

This tool can square up an image. This tool is particularly useful if you've taken a photograph of an image instead of using a scanner.

VIDEO: Perspective tool, Picture on a wall 5:44 <https://youtu.be/3vvKu36Vg8A>



Scale

Right-sizing an image for emailing or for display on the web is important. If an image is large it is going to take forever for the recipient to open the file, or the webpage to load. There are two ways to reduce the number of bytes being sent. One is to reduce the dimensions (pixels), the other is to reduce the quality when you Export the document.

Hint: Use the Ctrl key while dragging the scale tool to keep the image ratio.

VIDEO: Scaling an Image 2:14 https://www.youtube.com/watch?v=6DHxgkSG_Zw&t=0s



Cropping an image

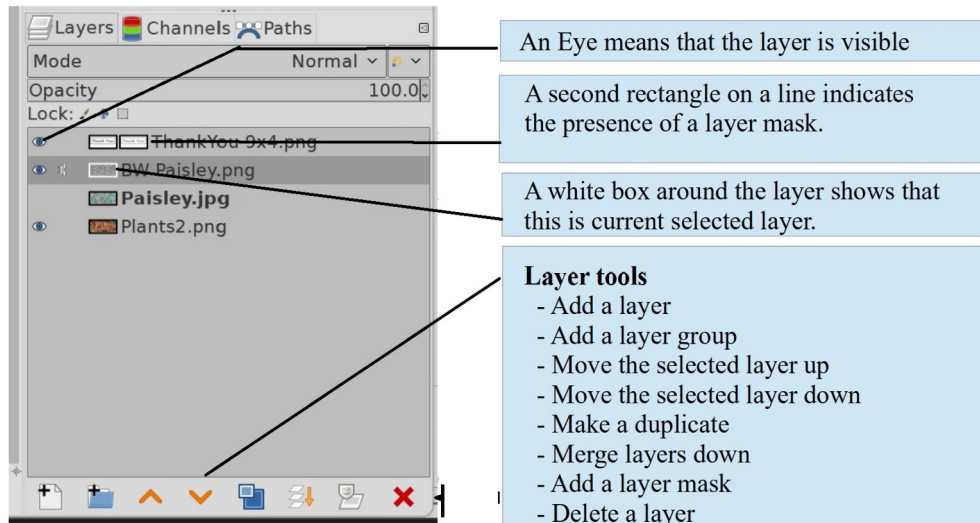
Cropping, (cutting the edge off of photos) is used to remove an unwanted irrelevant detail from a **photo**, change its aspect ratio, or to improve the overall composition. Select the area with the cropping tool, and then click inside the image.

VIDEO: How to crop an image 1:56 <https://www.youtube.com/watch?v=2QMAhaSWf3E>

LAYERS

As you get more into creating content, you'll need to have some understanding of layers. You even need to understand layers to cut and paste.

LAYER DIALOG



When working with layers it is very important to know which layer you are working on. The dockable layer dialog box started life in the lower right hand corner of GIMP. If it went missing you can call it back up using CTRL + L or from the menu Windows → Dockable Dialogs → Layers. The layer that has focus is will be the rectangle that has a white box around it.

Canvas – the area that is going to be included in our exported picture.

Think of building a collage, you are given a bunch of pictures to arrange in some artful way on a piece of paper or poster board, that would be your canvas. The order that you the pictures on it would be your layers, and the finished product, everything on the canvas would be your image.

Alpha Channel – Include transparency on a layer

When a layer has an alpha channel, it changes how the eraser tool and the delete of a selection works. If there is no alpha channel, the eraser just paints with the background color and delete fills the area with the background color. If there is an alpha channel using the eraser or deleting a selection makes the area transparent any you can see through it to the layer below.

VIDEO: Circles 6:44 <https://www.youtube.com/watch?v=v2ZE9oQH4YE>

VIDEO: Image vs Layer 5:21 <https://www.youtube.com/watch?v=gwJP7sUaXeI>

VIDEO: Door, Clock, Dog 6:12 <https://www.youtube.com/watch?v=v2ZE9oQH4YE>

ARTICLE: <https://www.lifewire.com/introduction-to-layer-groups-in-gimp-1701685>

Layer Masks

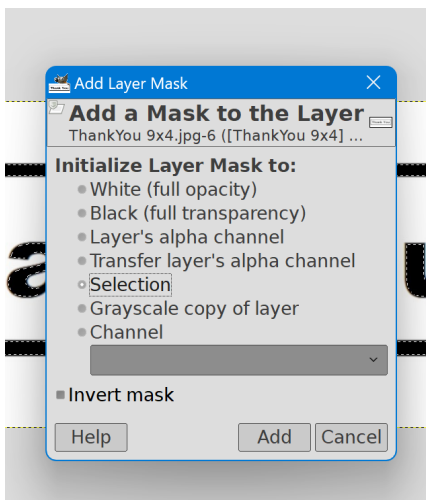
Layer masks are a fundamental tool in image manipulations. Masks allow you to selectively modify the opacity (transparency) of the layer they belong to. Masking differs from the use of the layer Opacity slider as a mask has the ability to selectively modify the opacity of different areas across a single layer.

Anything painted **black** on the layer mask will be **transparent** on the layer.

Anything painted **white** on the layer mask will be **visible** on the layer.

Anything painted with other colors will have interesting effects on the transparency.

The reason we prefer masking to erasing directly from the photo, is that if you need to un-erase something, you can restore it by painting white on the layer mask, no matter how many other edits you did before you noticed that you goofed on your original erasure.



You can add a mask to the selected layer, either by going to the menu and selecting **Layer → Mask → Add Mask** or by clicking on the mask icon in the layer toolbox.

When you add a layer mask you have several choices on how to initialize the mask. The three I find most useful are:

A full white layer mask, so everything on the layer is visible.

A full black layer mask, so nothing on the layer is visible.

Selection mask, so only the selection will be visible on the layer.

Layer masks are a complicated subject but getting your head around the basic concept opens up many more ways to enhance your photos

VIDEO: Thank You

<https://youtu.be/YMj2HCfSXys>

VIDEO: Quick mask Cat 2:52

<https://www.youtube.com/watch?v=OR2yOhKJdnU>

VIDEO: Partial Colored Duck 3:11

<https://www.youtube.com/watch?v=qPMmfUNmsJM>

VIDEO: Partial Colored Toys 4:14

<https://www.youtube.com/watch?v=a7st18ZwlAY>

VIDEO: Scald the bunny 8:11

https://www.youtube.com/watch?v=PI8_2FnIow0

VIDEO: Cutting out Hair 6:42

<https://www.youtube.com/watch?v=AnbxtMCHKV0>

VIDEO: Remove background 9:14

<https://m.youtube.com/watch?v=FD8qqh3ySI4>

Luminosity Mask

ARTICLE: <https://patdavid.net/2011/10/getting-around-in-gimp-luminosity-masks.html>

VIDEO: Luminosity Mask 22:10 <https://www.youtube.com/watch?v=3Izcmh1ZB4U>

Layer Modes

Layer modes are also sometimes called “blending modes”. Selecting a layer mode changes the appearance of the layer or image, based on the layer or layers beneath it. If there is only one layer, the layer mode has no effect. There must therefore be at least two layers in the image to be able to use layer modes.

Gimp has 38 layer blending modes divided into 7 categories.

Normal (Normal, Dissolve, Erase, Color Erase, Merge and Split)

Lighten (Lighten only, Luma/Luminance, Screen, Dodge, Addition)

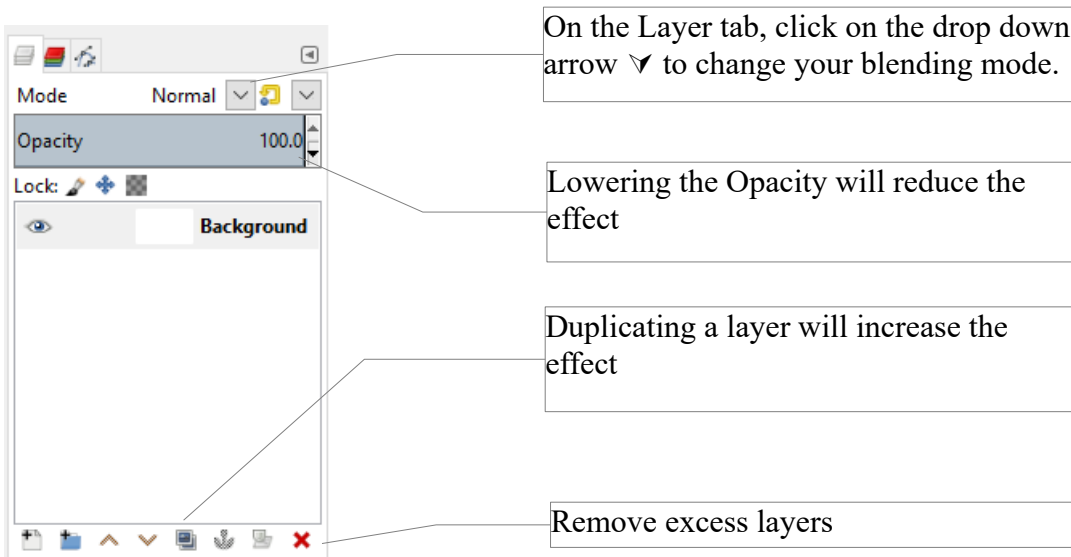
Darken (Darken only, Luma/Luminance. Multiply, Burn, Linear burn)

Contrast (Overlay, Soft light, Hard light, Vivid light, Pin light, Linear light, Hard mix)

Inversion (Difference, Exclusion, Subtract, Grain extract, Grain Merge, Divide)

HSV components (HSV Hue, HSV Saturation, HSL Color, HSV Value)

LCh components (LCh Hue, LCh Chroma, LCh Color, LCh Lightness, LCh Luminance)



An understanding of layer modes, helps you get better results out of GIMP, and its worth while watching this 1 hour long video.

VIDEO: Comprehensive look at layer modes 58:32 <https://www.youtube.com/watch?v=17Ivi0tmug>

SHARPENING

There are many ways to sharpen your images in GIMP. We are going to look at 4 of them. The first two are built in functions of GIMP. The next 2 require adding plugins,. See section on “How to Add a GIMP PlugIn”

Filter → Enhance → Sharpen (Unsharp Mask)

Click on this option, fiddle with the sliders until you get the results you want, and then save your results.

VIDEO: Raspberries in the bowl 4:05 <https://www.youtube.com/watch?v=fFZV4zT1fec> .

VIDEO: Sharpen an Image 1:44 (music no description)

<https://www.youtube.com/watch?v=StNx2RJxbW4>

Filter → Enhance → High Pass

High pass filtering gives much better results than the **Sharpen (Unsharp mask)**, but it is a little more complicated because now you are dealing with layers.

Old method:

1. Create a duplicate layer of the image. This is not just for comparison!
2. Run **Filter → Enhance → High Pass**, and adjust the **Std. Dev.** and **Contrast** settings to your liking.
3. On the layer tab, change the **Layer Mode** type from Normal, to the desired blending mode. Typically Grain Merge.
4. Duplicate the layer, as necessary, to increase the effect.
5. When you like what you see, merge the layers , **Image → Merge Visible layers**

VIDEO: The Fly 4:06 <https://www.youtube.com/watch?v=6AvIAgjQCFO>

VIDEO: Buttons https://www.youtube.com/watch?v=cYWOK5v_OuY

Filter → Enhance → Wavelet-decompose

Wavelet decompose is a GIMP plugin. You will need to download and install this tool separately.

This tool makes a copy of your image and divides it into layers that can be worked on separately. This tool is very good for airbrushing faces while leaving the detail intact.

Filter → G'MIC Qt → Details → Sharpen [Octave Sharpening]

The G'MIC Qt method requires a plugin.

Video: <https://www.youtube.com/watch?v=YjqMT7Mn2ac>

DENOISE

There are two types of noise, color and luminosity (white dots). They make the picture look grainy. The methods for fixing this involve blurring the photos.

Filter → Enhance → Denoise

This method blurs the whole picture or a selection. When used on the whole picture it generally yields unacceptable quality.

Two step method using HSL and G'IMC Smoothing

This method requires the G'IMC Plugin. It give much better results than a simple denoise

Reduce Color noise

Duplicate the layer

Filter → Blur → Gaussian Blur until color noise disappears

Set Layer mode to HSL Color Mode to blend the colors with the layer below

Layer new from Visible

Remove Luminance noise with smoothing

Filter → G'MIC Qt → Repair → Smoothing

Try various settings

VIDEO: How to Easily Denoise Photos in GIMP 7:25

<https://www.youtube.com/watch?v=Ie4yrT0angI>

COPY AND PASTE

Even **Copy** (Ctrl + C) and **Paste** (Ctrl + V) behave differently in GIMP. When you paste a floating layer is created. To finish pasting, right click on the floating layer, and then choose **Anchor Layer** or **To New Layer** depending on what you want to do with the paste.

VIDEO Copy and Paste 3:54 <https://www.youtube.com/watch?v=18Kx9k66coY>

TROUBLESHOOTING

Missing Controls and Panels

VIDEO https://www.youtube.com/watch?v=MNRS_e4lsxU&t=0s&list=PLTNGHxWTzJRdusrUb9BuZh0f95z6Ny7q&index=7

When Tools don't work

VIDEO <https://www.youtube.com/watch?v=kDOhxuiQ7ZU>

Hint If you can't get your clone and healing to sample an area try selecting the magnifying tool and zooming in, and zooming out CTRL and Zoom and then reselect the healing tool and try to get the sample.