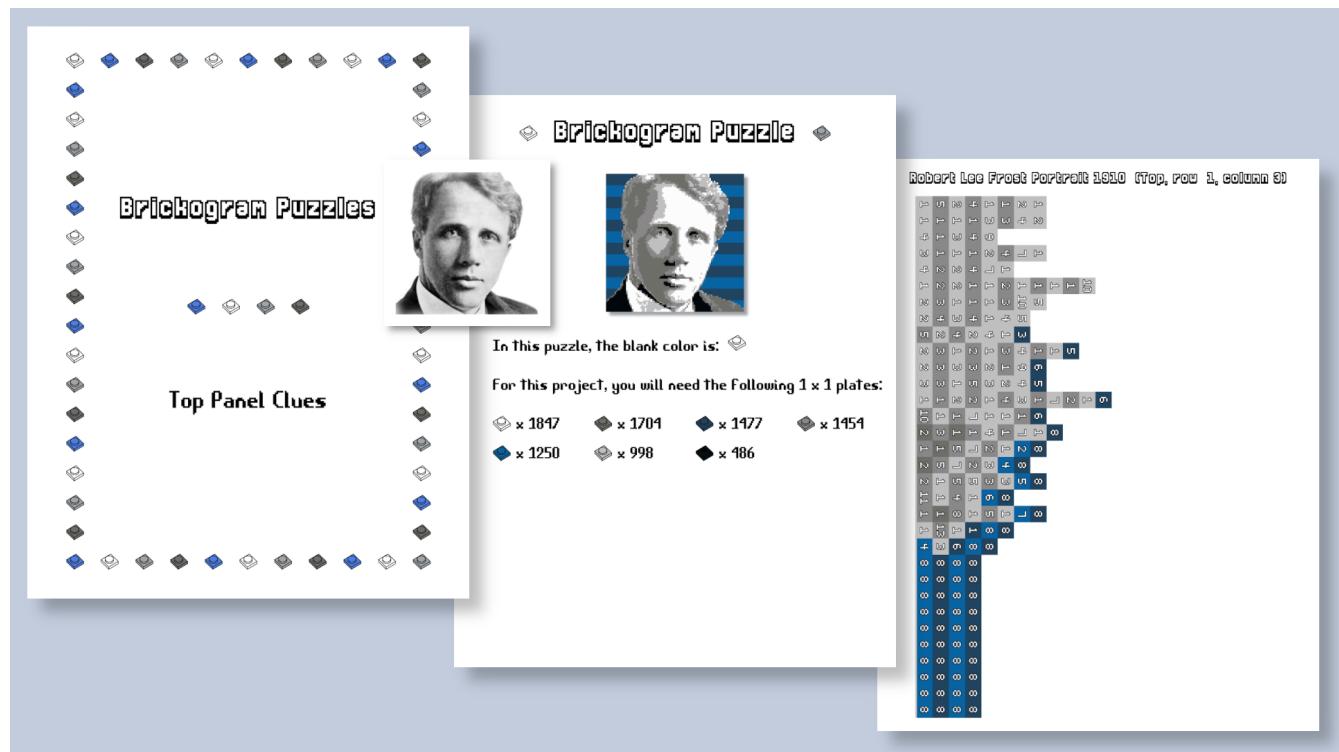
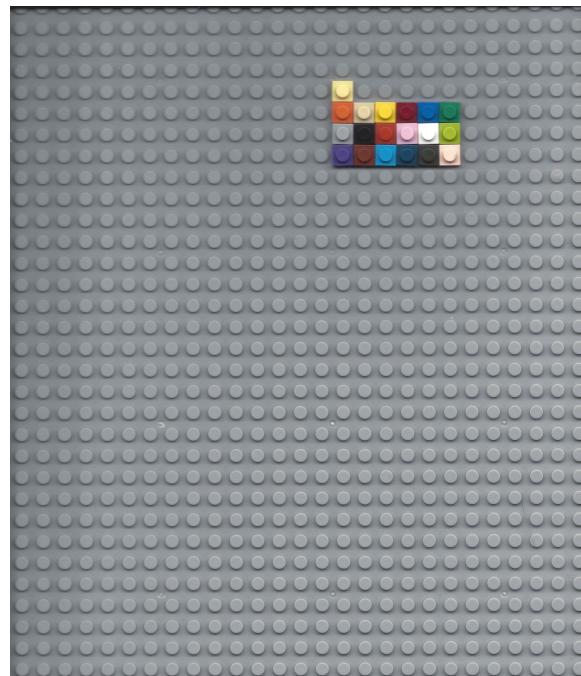


Instructions on How to Use Gimp to Generate Pixelated Images for Brickogram

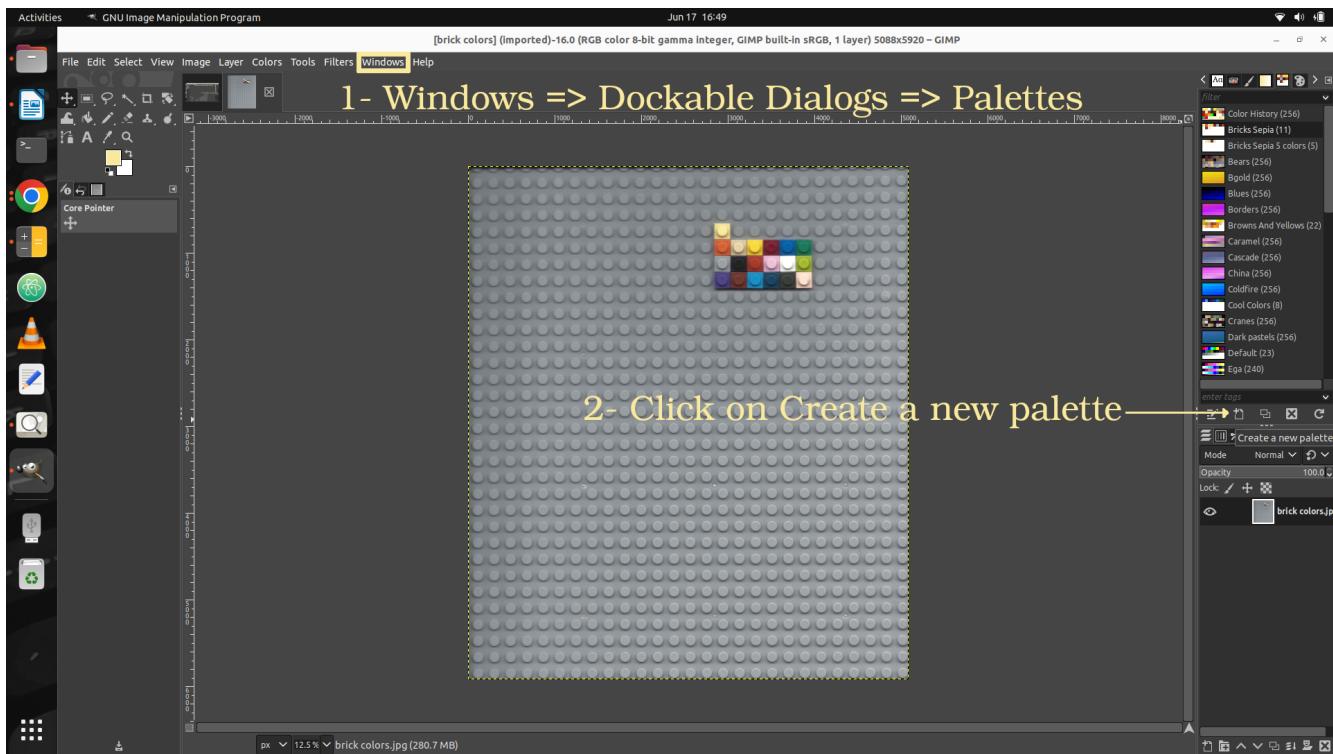


Creating a Custom Color Palette in GIMP, Based on the Colors of Your 1 X 1 Plates:

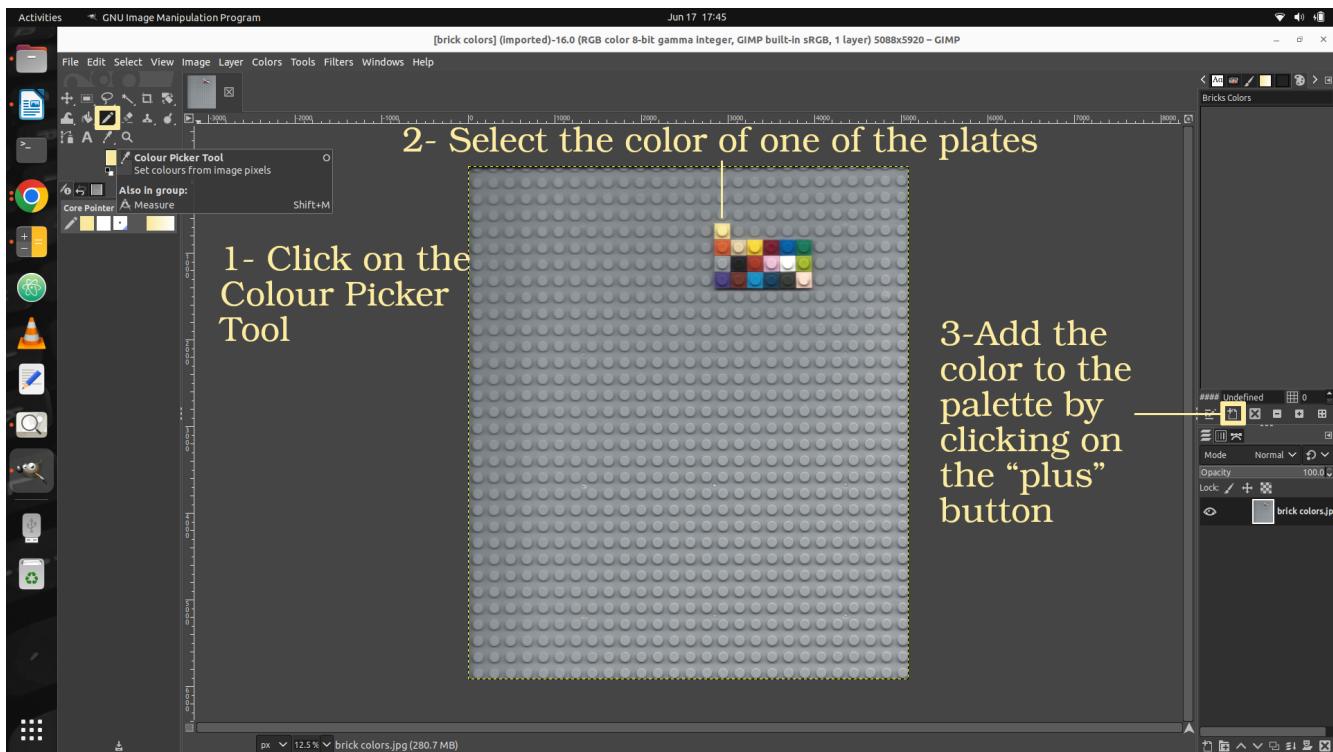
Step 1. Place all of your different colored 1 x 1 plates onto a base plate and scan it. The scanned image will allow you to extract each color to make up the color palette of your brick set.



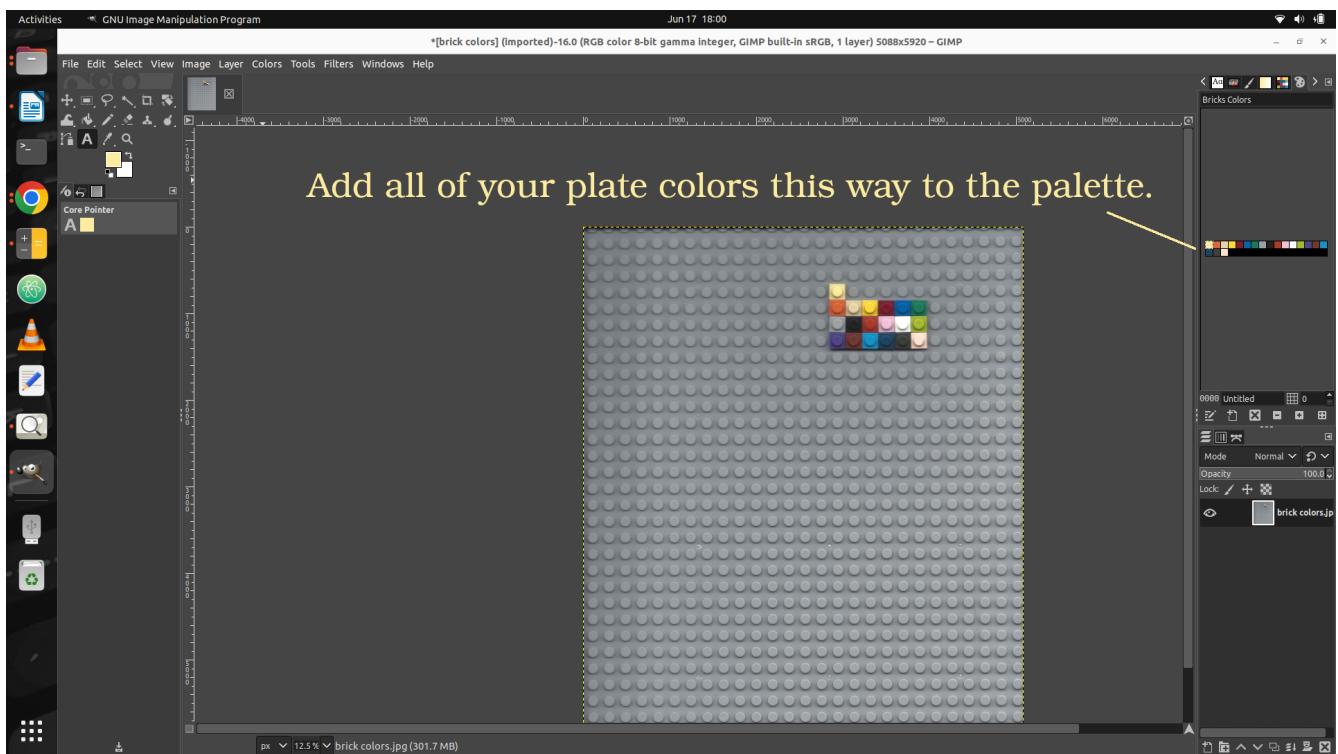
Step 2. Open the image in GNU Image Manipulation Program (GIMP). From the “Windows” menu, select the “Dockable Dialogs” item, and the “Palettes”. Then click on “Create a new palette”.



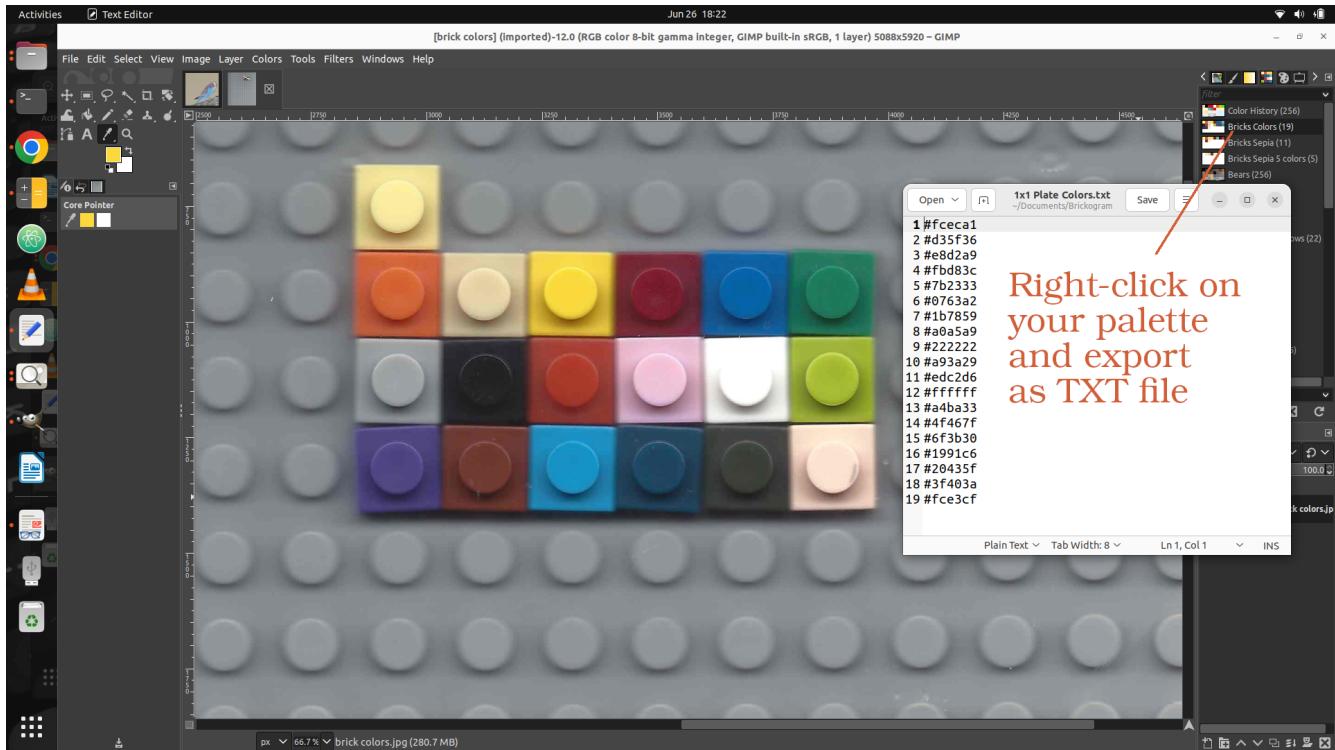
Step 3. Click on the “Colour Picker Tool”, then select the color of your first plate by left clicking on it, and finally add the color to the palette by clicking on the “plus” button.



Step 4. Add all of your plate colors this way to the palette. You could also create another palette with a subset of your 1 x 1 plate colors (some sepia tone colors, for instance), allowing for different renditions of your images. An important point when creating your palettes is that you need to use the same color hex code to designate a given plate color in each of your different palettes. **You should therefore only select the color of a given 1 x 1 plate once using the “Colour Picker Tool”,** and then take note of that hex code (see the next image) for later use in other palettes, or if you mistakenly delete your color palette. This way, all of the colors of the pixelated images that you generate will exactly match those that you initially detected when first creating your palette. Otherwise, the very closely related colors originating from several different “Colour Picker Tool” actions wouldn’t necessarily be equated by the code, resulting in frustration for you down the road, as these different colored clues wouldn’t be merged together (several closely related shades of yellow, for instance).



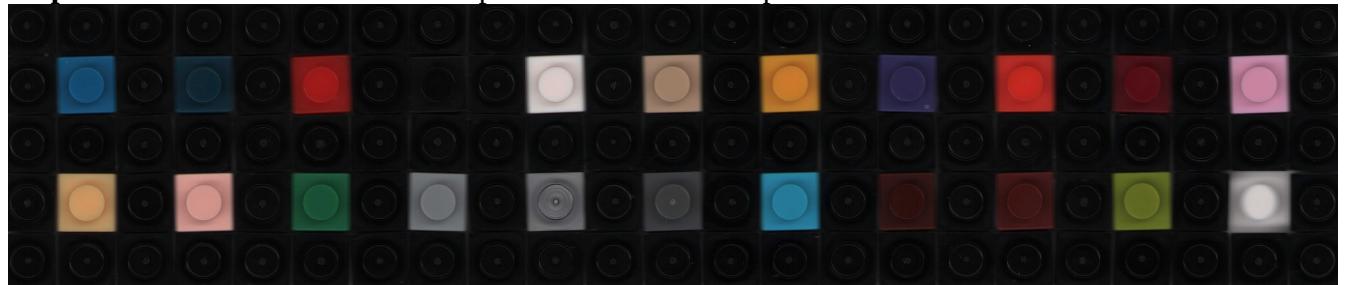
Step 4 (Cont'd). You can simply export the list of all the hex codes making up your custom color palette by right clicking on it and selecting the “export as text file” option.



Adding More Color 1 x 1 Plate Scans to the “1 x 1 plate scans” folder:

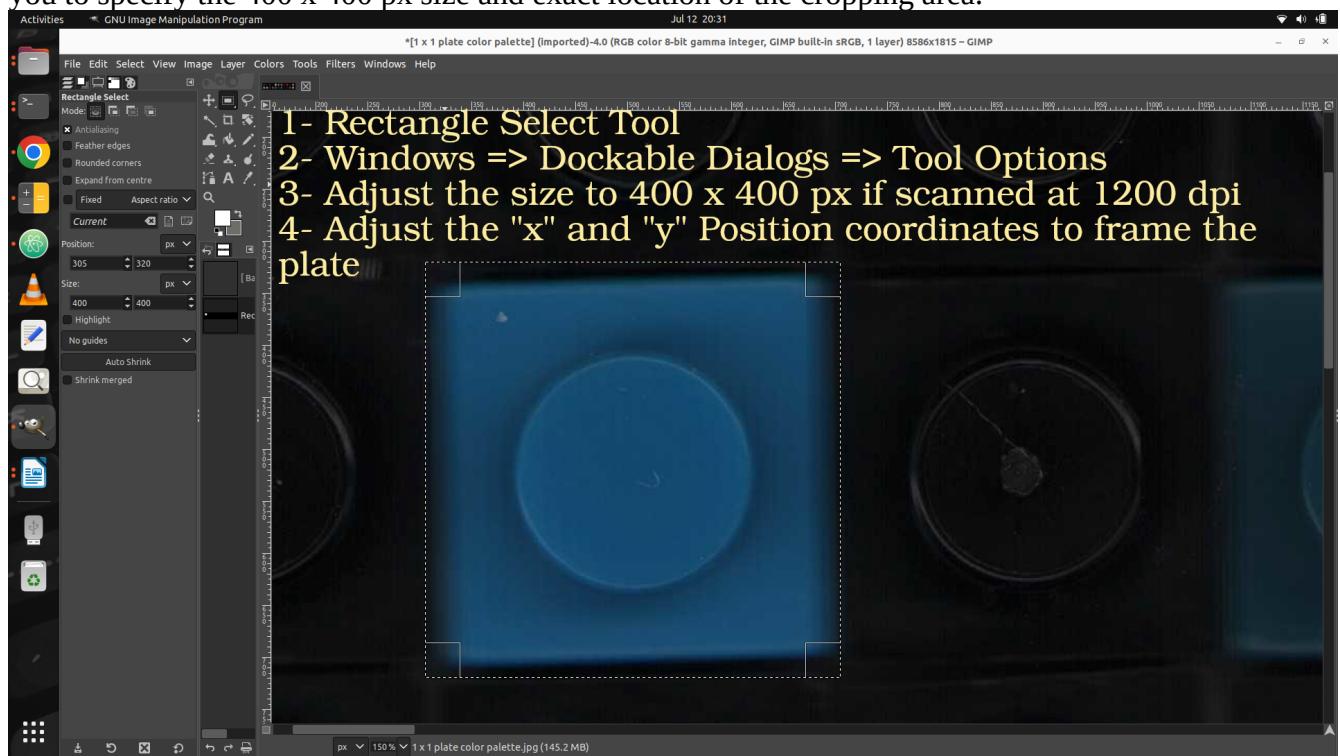
The 1 x 1 plate scans found within the “1 x 1 plate scans” folder are used by the Python code to generate the answer key and the thumbnail of what the finished mosaic will look like. The folder will then need to contain scans of all the colors that you will use in your mosaic. Here are the steps required to add a new 1 x 1 plate scan to the folder.

Step 1. Surround each colored 1 x 1 plate with black 1 x 1 plates.

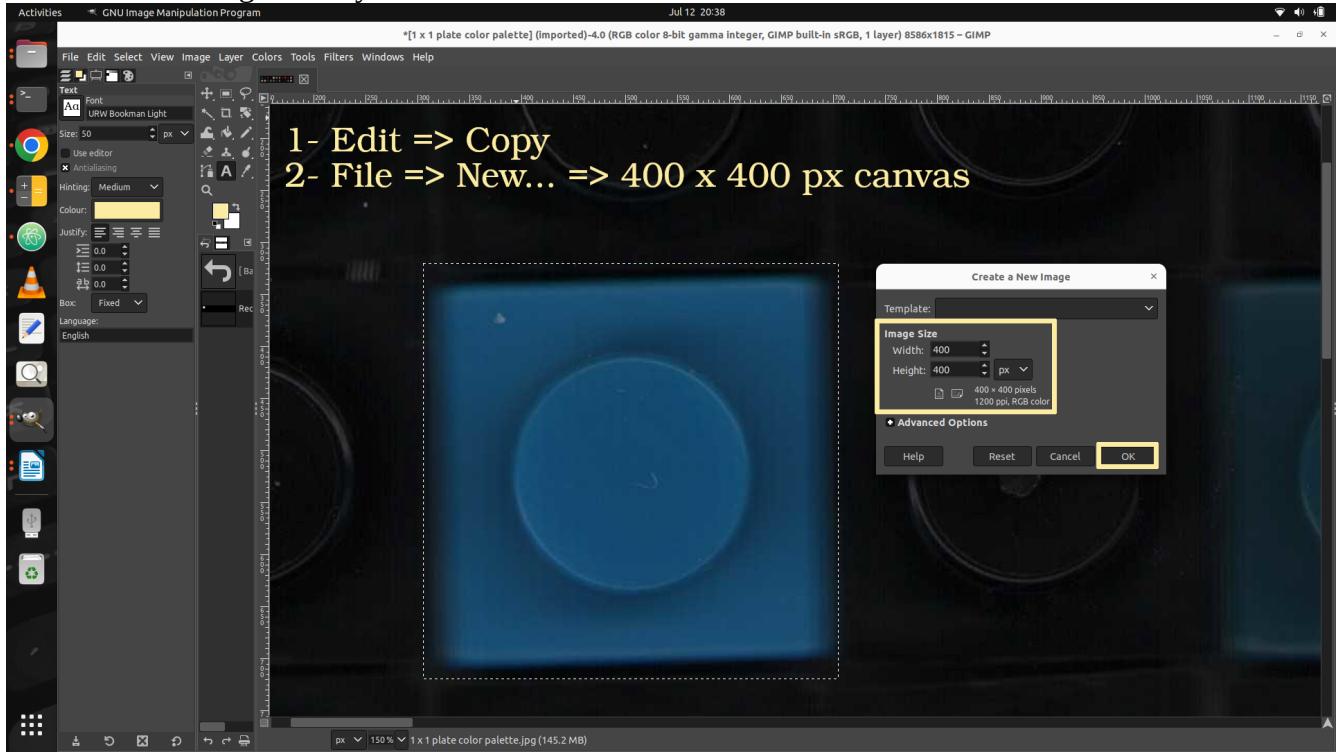


Step 2. Scan at a resolution of 1200 dpi (you would need to scale down the 400 x 400 px cropping area accordingly should you scan at a lower resolution).

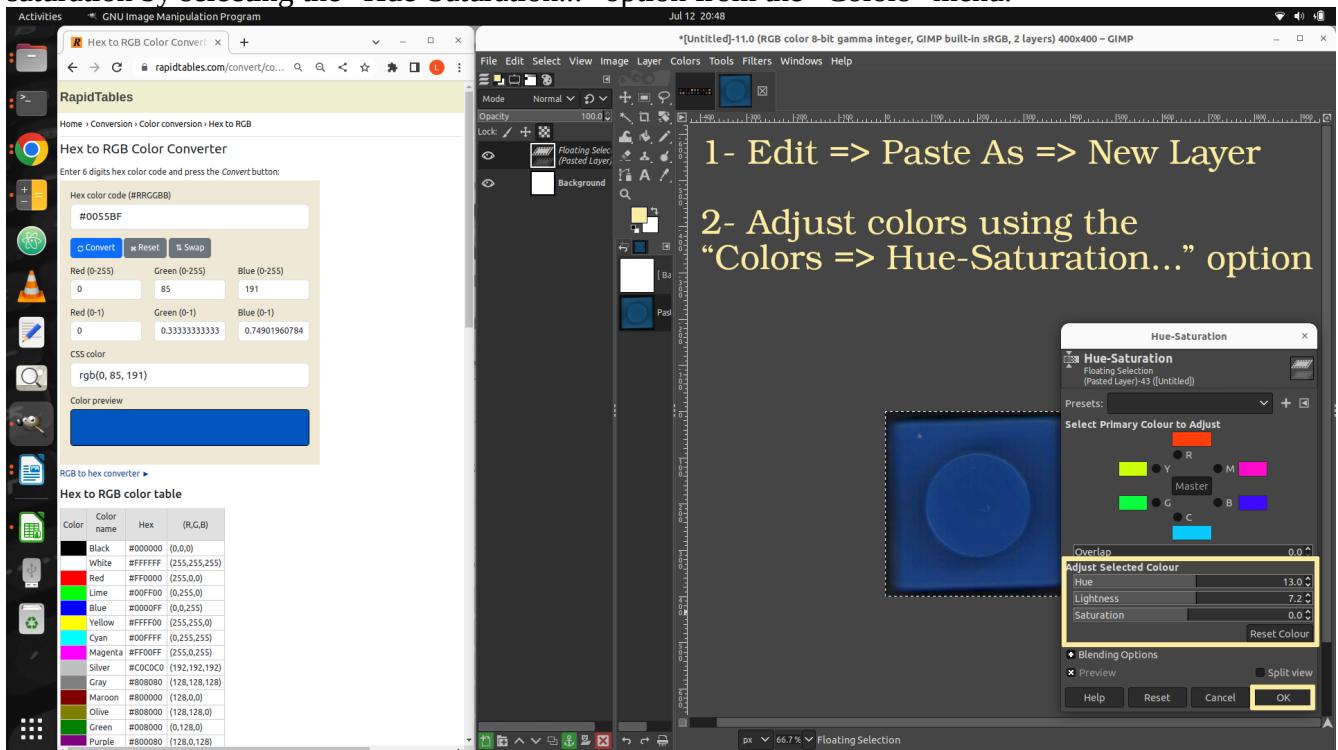
Step 3. Select the 1 x 1 plate using the “Rectangle Select” tool, with the “Tool Options” panel allowing you to specify the 400 x 400 px size and exact location of the cropping area.



Step 4. In the “Edit” menu, select “Copy”. Then, from the “File” menu, select “New...” and set the width and height to 400 px if you scanned the image at a 1200 dpi resolution. Otherwise, you will need to adjust the pixel size of the side dimension of the cropping area according to your scan resolution. Click on “OK” to generate your new canvas.



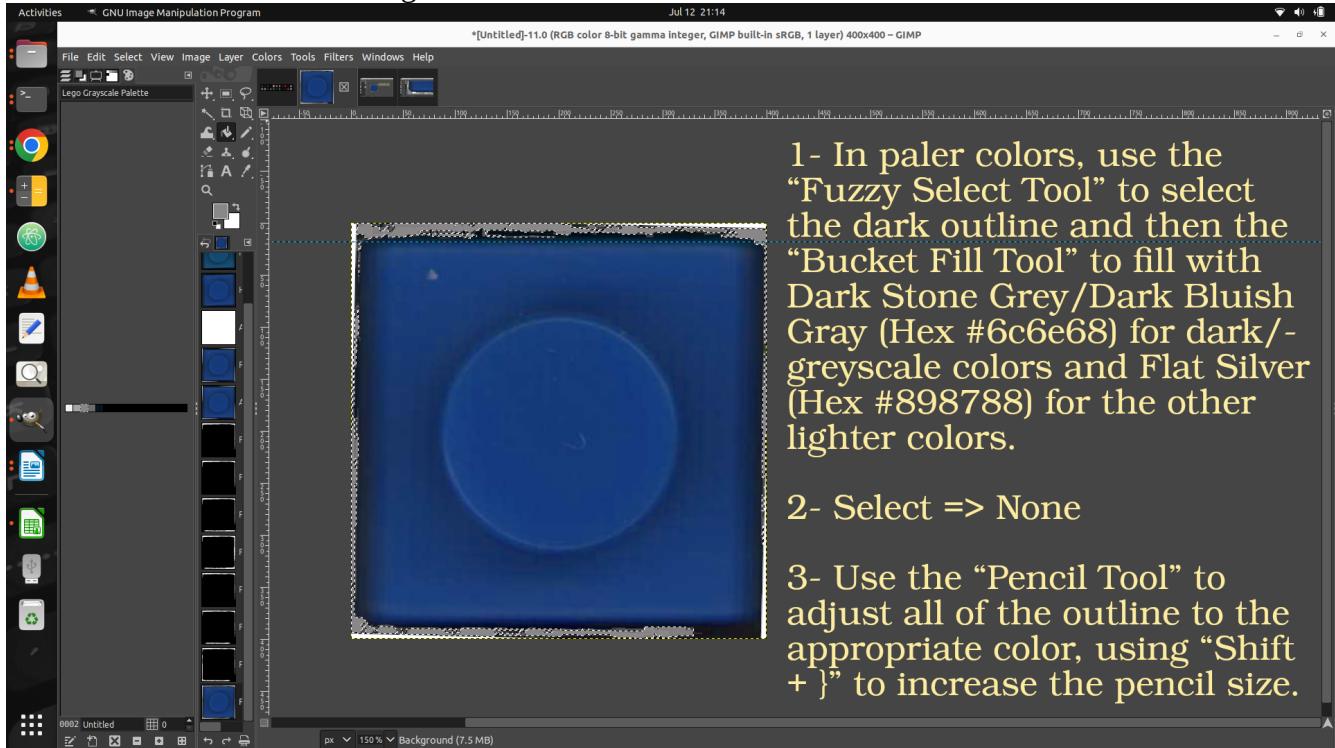
Step 5. Paste your cropped 1 x 1 plate as a new layer by clicking on “Edit”, then selecting “Paste As” and “New Layer”. Once that is done, use your reference Hex code value to adjust the hue, lightness and saturation by selecting the “Hue-Saturation...” option from the “Colors” menu.



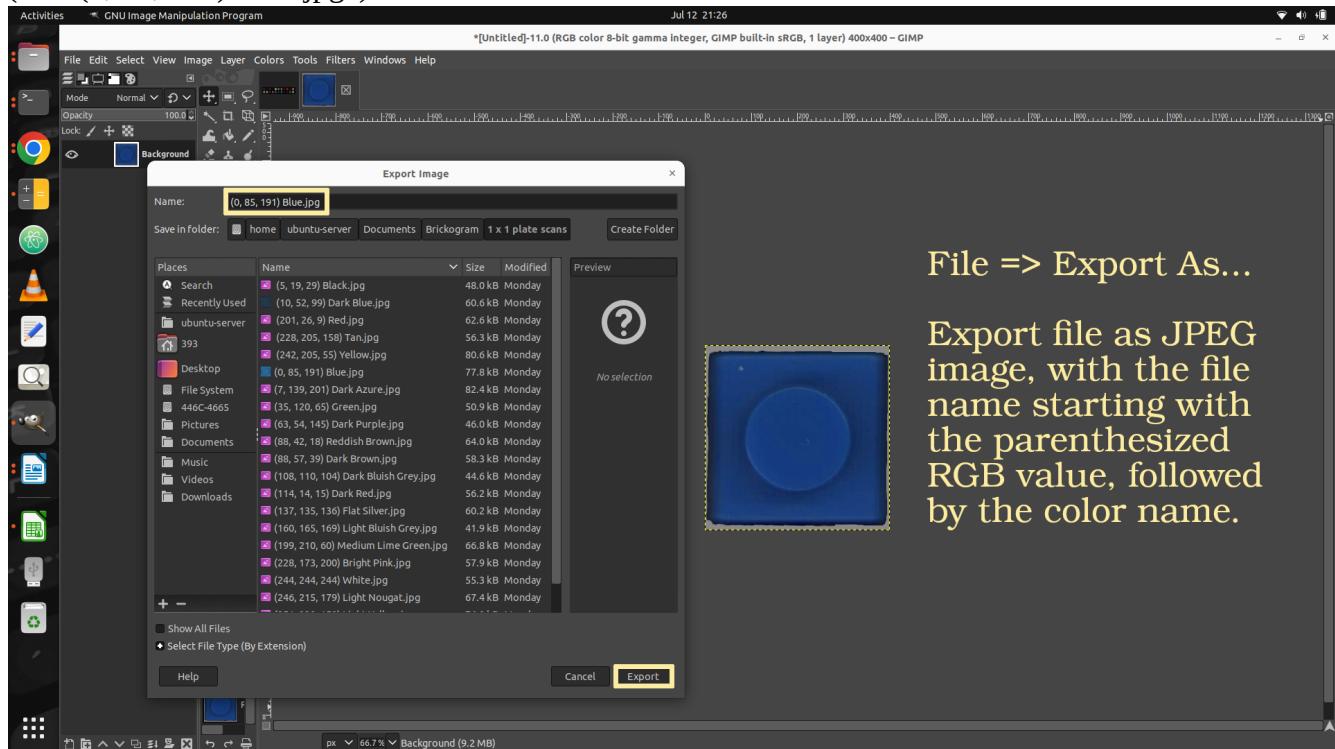
Step 6. From the “Layer” menu, select “Transform” and then “Arbitrary Rotation...”. Choose an angle that brings your 1 x 1 plate in line with a guide that you can slide into place by left-clicking on the top ruler and dragging the guide downwards. Clockwise rotations require a positive angle, while counter clockwise need a negative angle. Click on “Rotate” when you are done.



Step 7. Left click to anchor the floating layer, select the dark outline using the “Fuzzy Select Tool” and fill it with Dark Stone Grey/Dark Bluish Gray (Hex #6c6e68) for dark/greyscale colored 1x1 plates and Flat Silver (Hex #898788) for the other lighter colored 1 x 1 plates. Clear your selection by heading to the “Select” menu and choosing “None”.

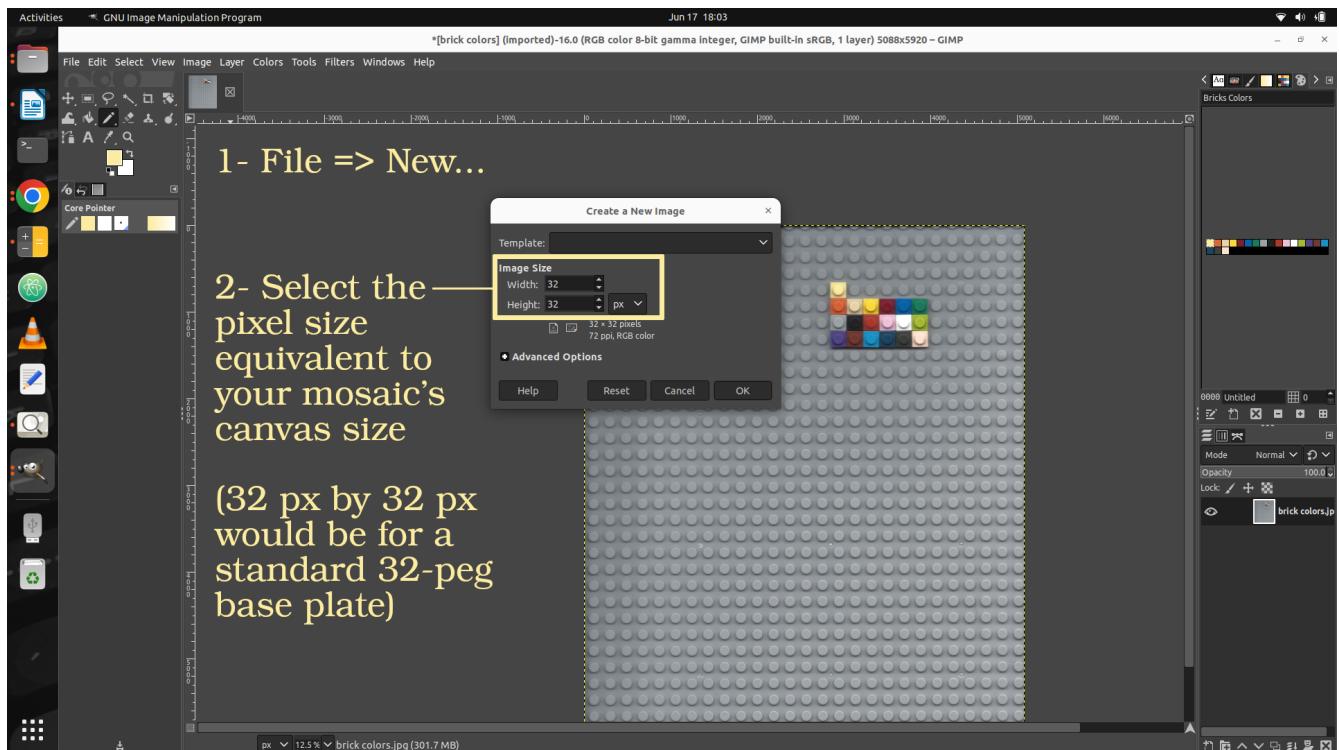


Step 8. Go to the “File” menu and select “Export As...”. Save the image as a JPEG file, with the file name beginning with the parenthesized RGB value, followed by the color name
(ex: “(0, 85, 191) Blue.jpg”)

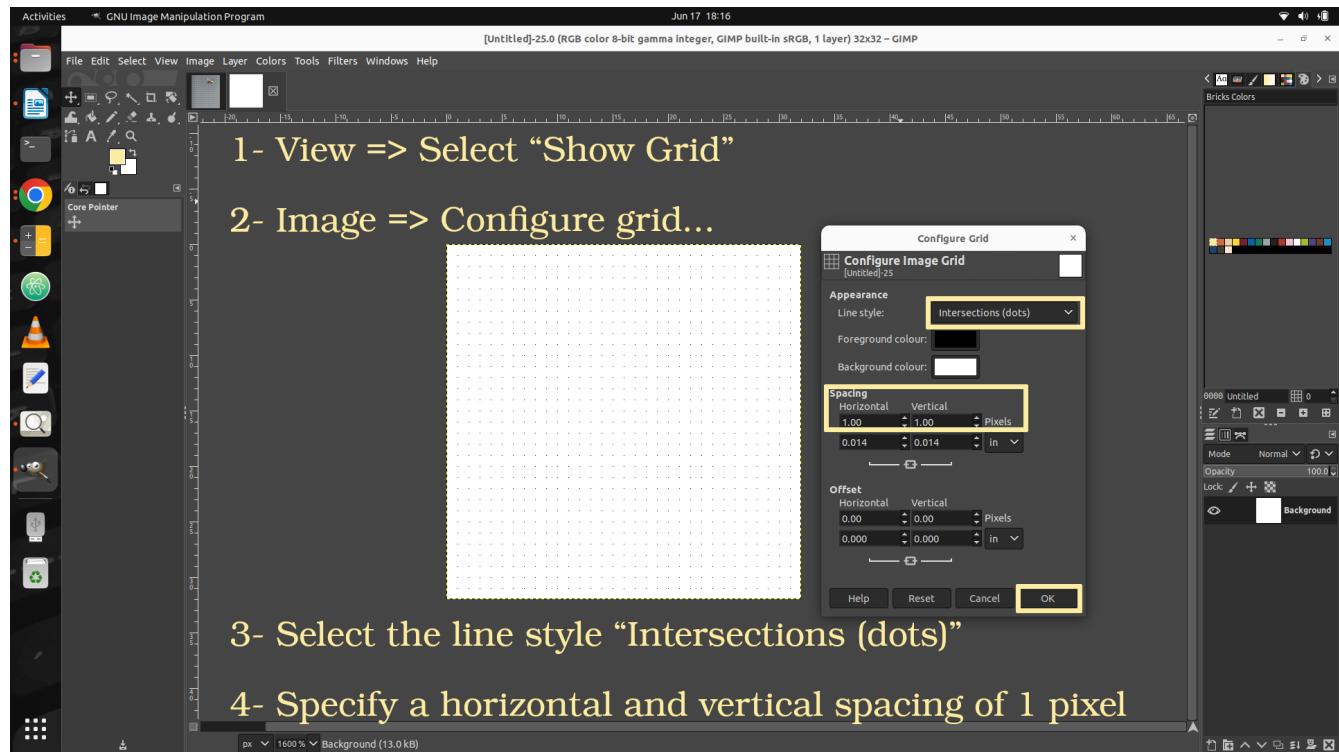


Drawing Pixel Art Using Your Color Palette:

Step 1. Create a new canvas by selecting the “File” menu and then clicking on “New...”. You will then need to specify the pixel size of the canvas, which is equivalent to the number of studs per side in your mosaic project. For example, for a canvas consisting of a single base plate, you would enter 32x32 pixels. Another mosaic project having a width of two base plates and a height of four base plates would require a canvas width of 64 px and a height of 128 px.

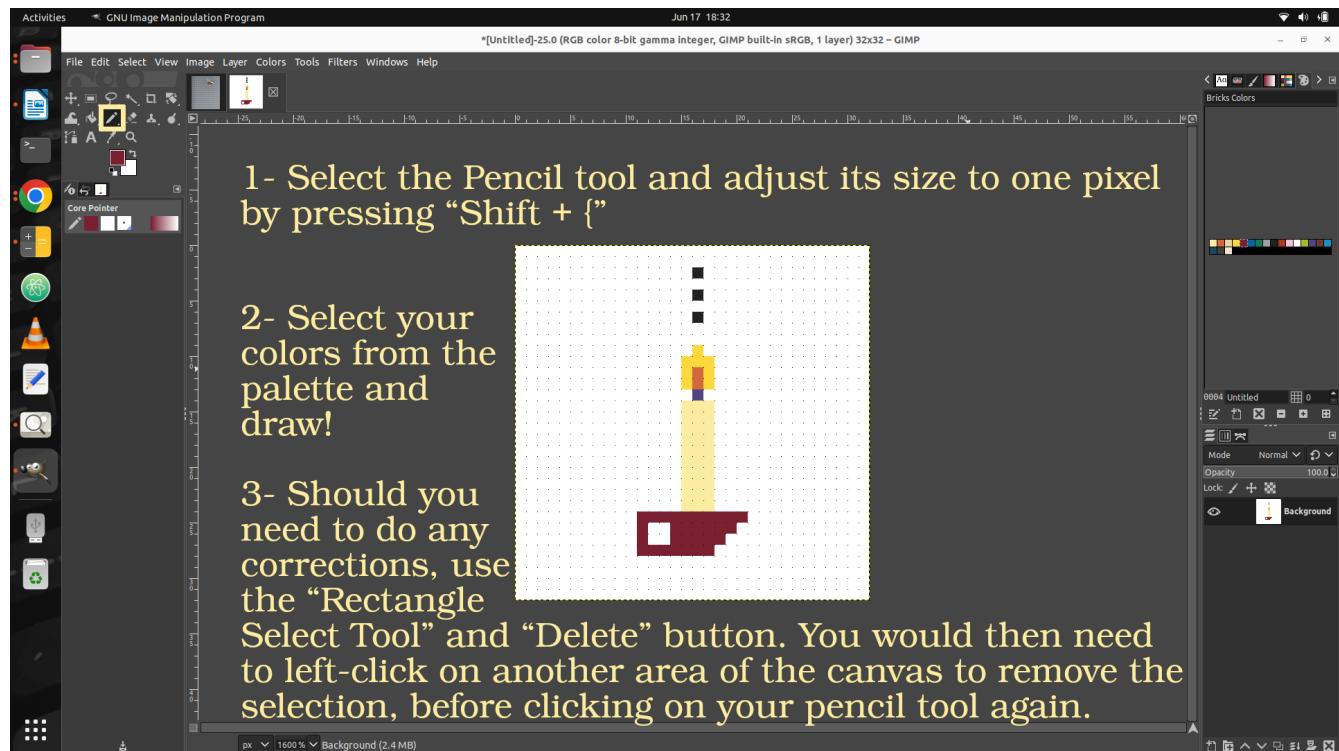


Step 2. In the “View” menu, tick the “Show Grid” option. Then, select the “Configure grid...” option from the “Image” menu. Choose the “Intersections (dots)” line style for better visibility while drawing. Also, you will need to specify a horizontal and vertical spacing of one pixel in order for the grid’s spacing unit to correspond to one pixel.



Step 3. In order to draw on your canvas, you will need to select the Pencil tool and adjust its size to one pixel, by pressing Shift and “{”. After that, it’s as simple as selecting your colors from your palette on the right and left clicking on your canvas to draw pixels! Should you need to make any corrections, you would have to click on the “Rectangle Select Tool” and select the pixels that you wish to delete, then hit the “Delete” button. After you are done deleting, you would need to left-click on another region of the canvas in order to cancel the selection, and then select the Pencil tool once again to continue drawing.

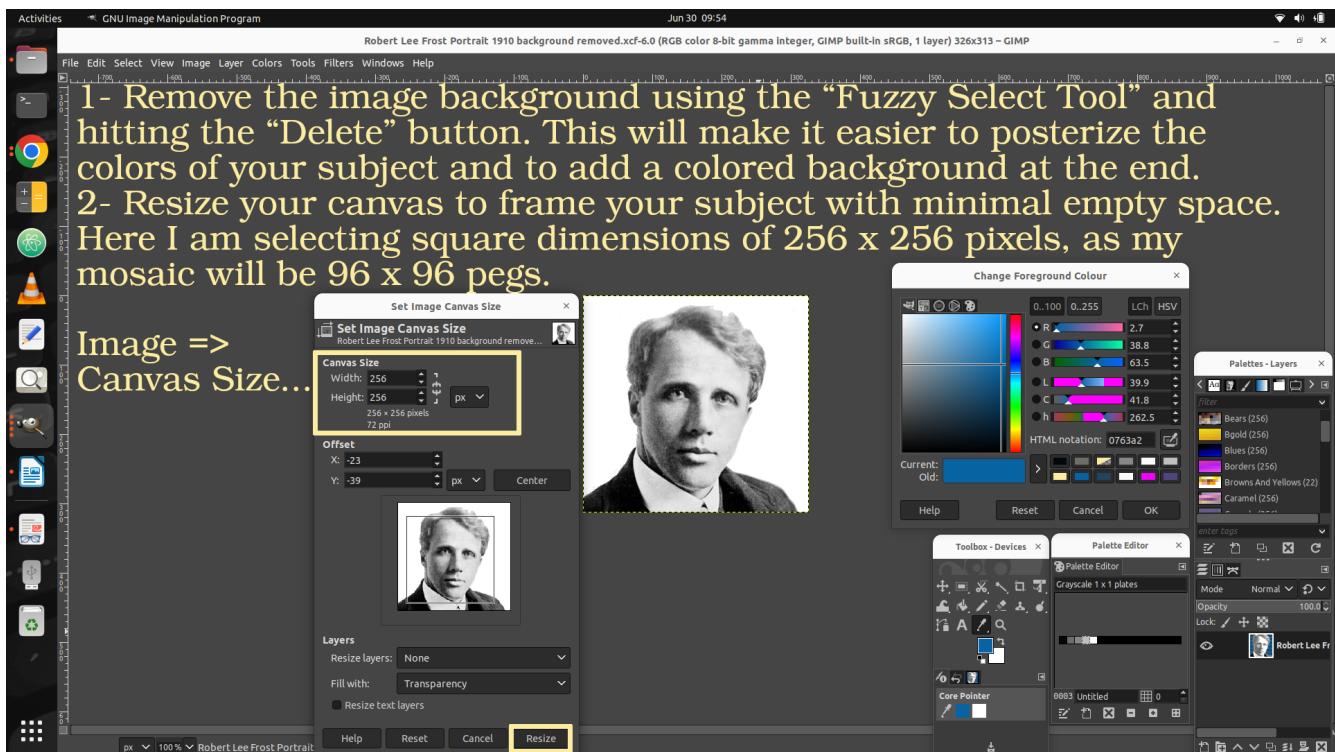
Keep in mind that when generating pixelated images, the number of color transitions from one pixel to the next on any given row or column, excluding the blank pixels, should be at most 23, in order for all of the colored squares to be printed on the nonogram instruction sheets. The code automatically checks for this, and will let you know if there are any issues and where to correct them.



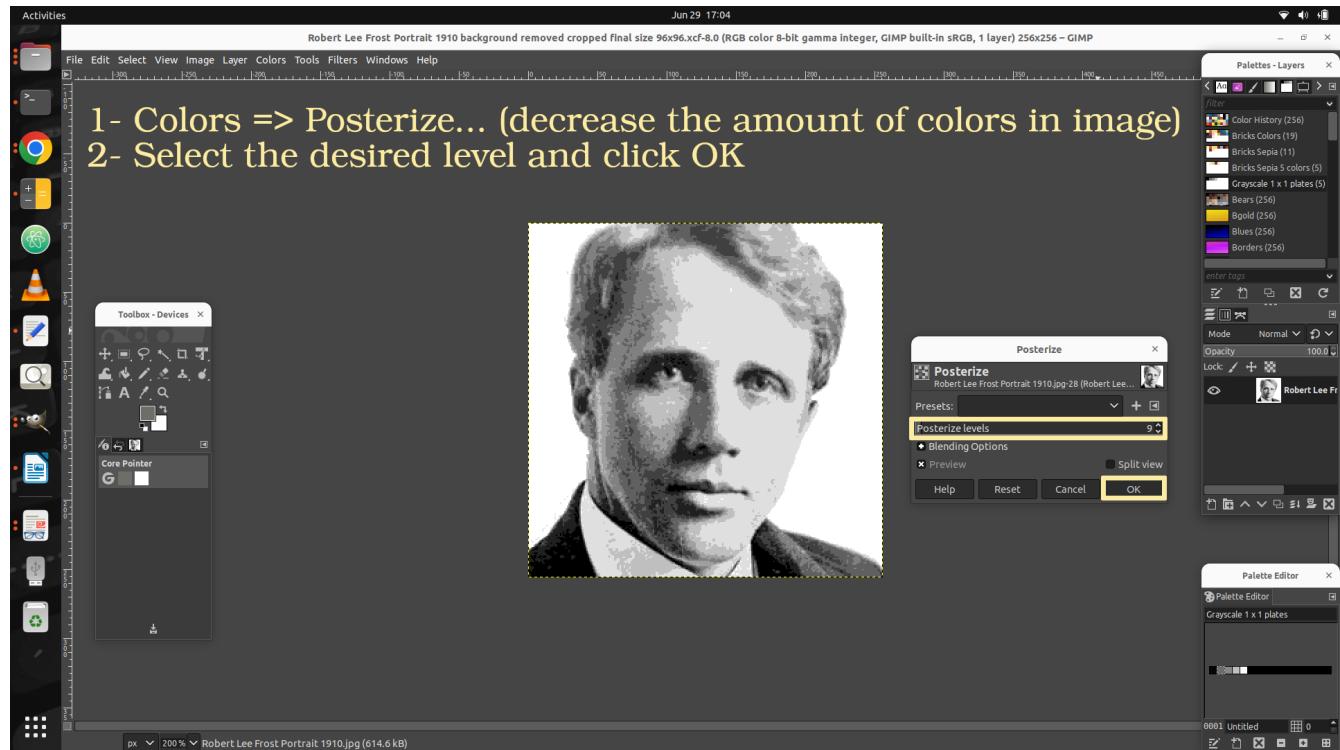
Converting Images Into Pixel Art Templates Using Your Color Palette:

Step 1. Open your image in GIMP and remove the background by using the “Fuzzy Select Tool” and then by hitting the “delete” button. This will make it easier to adjust the colors later on (posterization step) and to add a colored background to your final image.

After that, go to the “Image” menu and select “Canvas size...”. Crop your image to properly frame your subject while minimizing empty space. This will enable you to have more detail in your picture. Here I have selected a square canvas of 256 x 256 px, as my final mosaic will be square as well (96 x 96 studs). The important thing to remember is that your mosaic dimensions on both sides should be a multiple of the nonogram grid size. For example, my 96 x 96 studs mosaic would be comprised of three 32 x 32 studs base plates on either side.



Step 2. Go to the “Colors” menu and select the “Posterize...” option. This tool will decrease the amount of colors in the image and group them in flat areas of different tones. This step will make it easier to index the remaining colors to those in your palette, for a smoother finish. Select your desired posterization level and click “OK”.



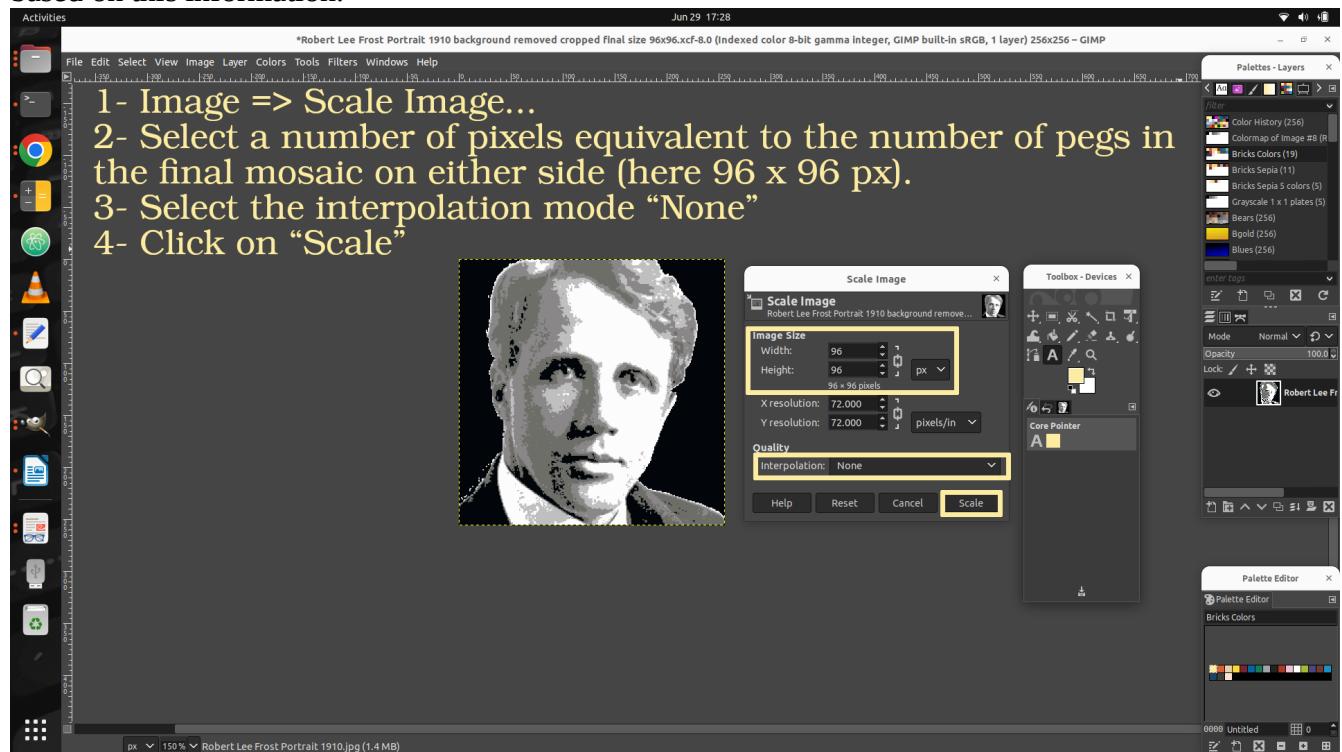
Step 3. First start by selecting the background with the “Fuzzy Select Tool” and set it to a contrasting color from your palette that doesn’t blend with your subject with the “Bucket Fill Tool”. This step is necessary because during the color indexing, you will ultimately lose some colors in your posterized image, and the indexed color of the background may then merge with that of a part of your subject, making it very difficult to place your background.

Once you have your contrasting background in place, go to the “Image” menu and select the “Mode” option, followed by the “Indexed...” mode. Select the “Use Custom Palette” and your palette, and click on “Convert”. This will transpose every pixel’s color in the image to the most similar color in your palette.

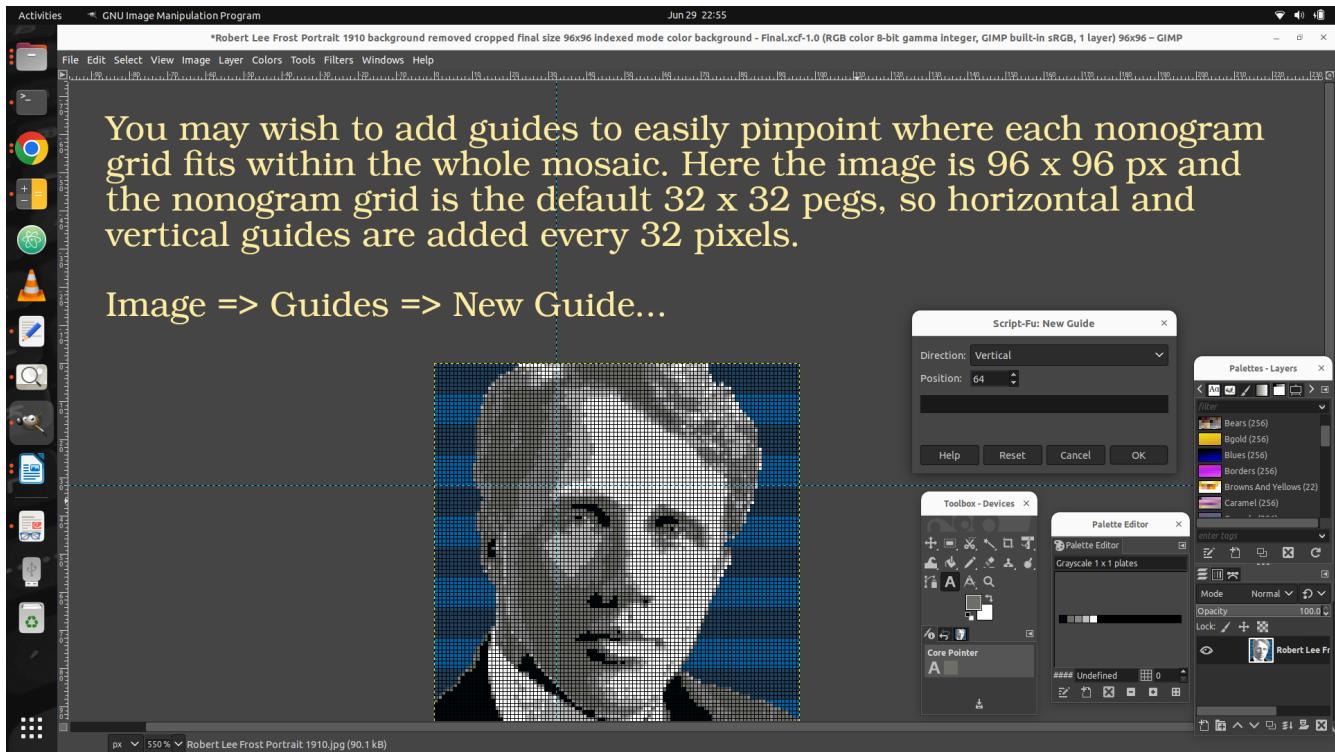


Step 4. After the color indexing step, you will need to scale down the image, such that the number of pixels in either dimension matches the number of studs in the corresponding side of your final mosaic. In my case, I started from a cropped image measuring 256 x 256 px and my final mosaic size is 96 x 96 studs. From the “Image” menu, select “Canvas size...” and adjust your width and height accordingly. Also, set the Interpolation to “None” in order to prevent any blurriness. After clicking on “Scale” you can move the layer in your canvas to frame it to your canvas size using the “Move Tool”, and then select “Layer to Image Size” in the “Layer” menu to crop your layer to your canvas size.

Before exporting your image, you need to make sure that there is at least one line in your pixelated image of a width of a single pixel, or at least one isolated pixel surrounded by pixels of a different color (such as the grey pixel in the pink patch of Picasso’s forehead in the image below). This requirement allows the code to figure out how many actual pixels make up an aggregated pixel, which is important to properly determine the color of each aggregated pixel, and elaborate the top and side panel clues based on this information.



Step 5. Adding guides to your project will facilitate locating particular rows and columns making up the individual nonogram grids. In my case, I have a mosaic of a size of 96 x 96 studs with a nonogram grid measuring 32 x 32 studs. The horizontal and vertical lines are then drawn every 32 pixels. Go to the “Image” menu, select “Guide” and then “New Guide...” to add a new guide to your project. These will not show up in the final image and can be toggled off by holding “Shift + Ctrl + T”.

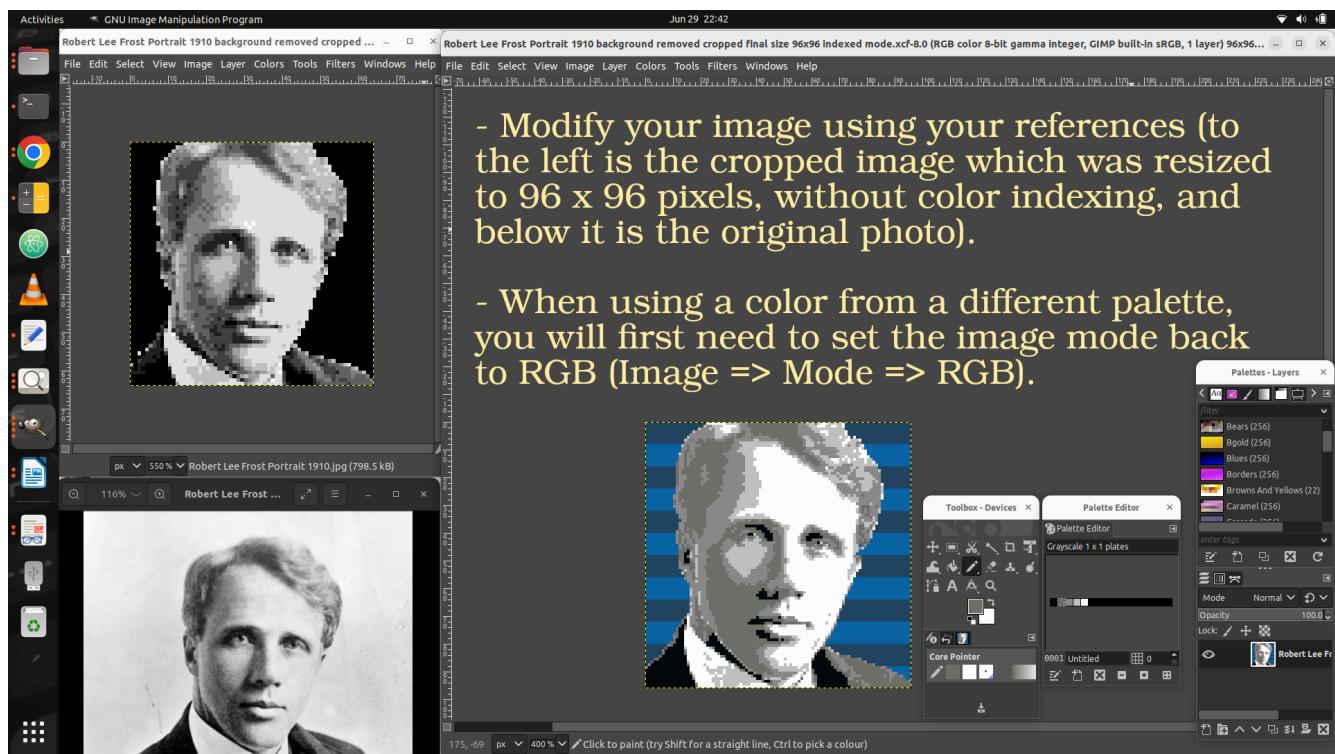


Step 6. At this stage, you may make corrections to your image, while keeping them within the available colors of your 1 x 1 plates. Select the “Show Grid” and “Snap to Grid” options from the “View” menu to facilitate your task.

You will need to revert the mode of your image back to “RGB” in order to be able to use colors from a different palette than that which was used to index the colors of your image. Head over to the “Image” menu, and then select “mode” and “RGB”. When using the “Pencil Tool”, make sure that the mode is set to normal and the opacity is 100%. The 100% opacity is important because it will avoid you ending up with different shades of the same color by overlaying the new color over the old one. The size of the “Pencil Tool” should be shrunk down to 1 x 1 pixel by repeatedly pressing “Shift” and “{”. Should you need to make corrections, you could use the “Rectangle Select Tool” to select the pixels, hit the “Delete” button to remove those pixels, and then left-click to clear your selection before clicking on the “Pencil Tool” again to resume drawing.

Keep in mind that when generating pixelated images, the number of color transitions from one pixels to the next on any given row or column, excluding the blank pixels, should be at most 23, in order for all of the colored squares to be printed on the nonogram clue sheets. The code automatically checks for this, and will let you know if there are any issues and where to correct them.

Once you are done modifying your pixelated image, simply export it as a **PNG file** by selecting the “Export As...” option from the “File” menu.



- Modify your image using your references (to the left is the cropped image which was resized to 96 x 96 pixels, without color indexing, and below it is the original photo).
- When using a color from a different palette, you will first need to set the image mode back to RGB (Image => Mode => RGB).