

CS 2033

Multimedia and Communications

Lab 03: Imaging with Affinity Photo

- Image Processing -

REMEMBER TO BRING YOUR MEMORY STICK TO EVERY LAB!

INTRODUCTION

This lab is a sequel to Lab 2 in which you learned about selections, clipping masks, re-touching tools, and cloning. In this lab, there is more about selections and converting them into masks and using masks to hide and show effects in specific regions. There is also an exercise on re-colouring and applying other effects to an image.

What you'll learn in this lab:

- Examining individual channels of an image
- Converting a selection to a mask layer
- Combining multiple images using a mask layer
- Showing colour in one region of a grayscale image using masks
- Recolouring an image using selective colour and other adjustment options
- Applying gradients to masks to achieve fade effects

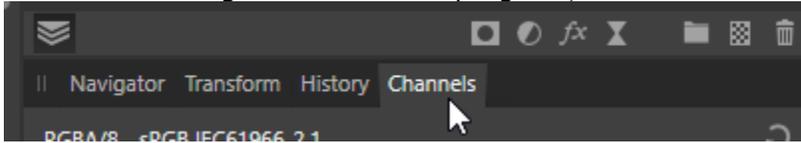
SETUP

Before starting the exercises described below, follow these steps first to get things set up:

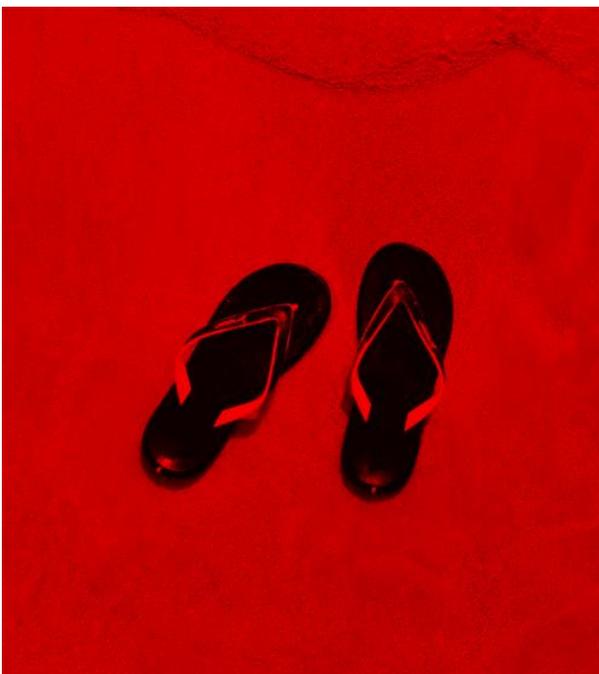
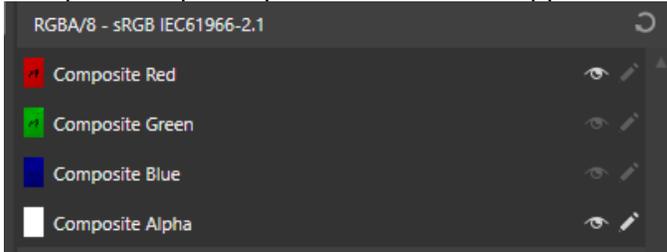
- Open File Explorer and navigate to your USB drive folder.
- Step into your **cs2033/labs** folder, which should have been created in Lab #1
- Create a subfolder within **labs** and call it **lab03**
- In a browser, open <http://www.csd.uwo.ca/~bsarlo/cs2033b/labs/lab03/img> and download all of the files listed there and move them into **cs2033/labs/lab03**.
- Open Affinity Photo. If you don't see the icon on the desktop, look for it in the main menu or click the magnifying glass at the bottom and search for it there

EXERCISE 1: CHANNELS

1. In Affinity Photo, open *beach.jpg*.
2. In the bottom-right corner of the program, click on the "Channels" tab.



3. Notice that in this panel, there are several coloured thumbnails to show each of the Composite components, then the current layer's (Background) components, and then the current Pixel Selection
4. Click "Add Pixel Layer" and notice that the middle set of components have changed to reflect the newly selected layer. Remove this new layer.
5. Click on the Rectangular Marquee Tool and make a rectangular selection. Notice that the "Pixel Selection" component at the bottom of the Channels panel now shows your selection as a white box within the black thumbnail. Deselect and then make another selection and see how it updates the Pixel Selection. Deselect again.
6. The last two steps were to show you the lower components in the Channels panel but they aren't as important as the upper section. Notice in the upper part that there are 4 items: Composite Red, Composite Green, Composite Blue, and Composite Alpha.
7. Click on each of the RGB Composite components one at a time to see the specific colour channel. Notice they are in grayscale here.
8. Click on Composite Alpha, which will just appear as white.
9. Click on the little eye icon in the Composite Red row so that it is visible along with the Composite Alpha layer. Now it should appear as Red.



10. Hide the red component by clicking on that eye icon again.
11. Now click on the green layer's eye icon to show that, and make sure the alpha layer is still showing too. When you've looked at that for a few seconds, hide the green and show the blue layer instead.
12. Whenever you are switching between channels, you can see them in grayscale or in the component's colour. Just remember the alpha layer has to also be visible in order to see the components in their own colour rather than grayscale.
13. Notice also that you can show multiple layers at the same time to see funky combinations, but again the alpha layer has to be visible for this to display.
14. Go through each of the R, G, and B components again (either in grayscale or colour) and look at the flipflops in each one. Which ones show the flipflops as the darkest? The lightest?
15. As you think about the above questions, think also about why this is the case. Review the original image's colours to help in answering this.

16. Open *boats.jpg*.

17. Repeat the steps above with this image to see each of the colour components.

18. As you go through each component, look at each of the boats and how they change from dark to light depending on which component you select. Compare this to the original, fully coloured image to help you understand why they appear like this.

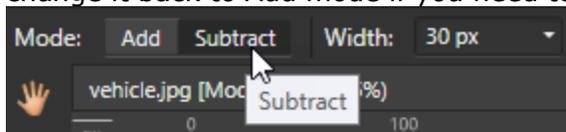


EXERCISE 2: CREATING MASKS

Here's a preview of what you will be creating in this exercise:

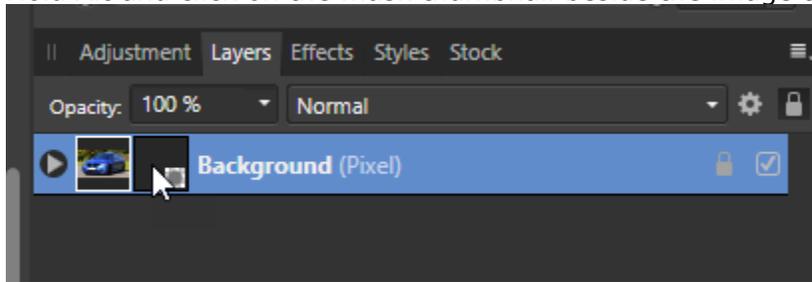


1. Open *street.jpg* and *vehicle.jpg* in Affinity Photo. We'll start working with the vehicle image.
2. Click on the Selection Brush Tool and set the brush's Width to 30px.
3. Click down and drag the cursor around the car to select all of it. Make sure you include wheels, lights, mirrors, and all other parts of the car. Don't worry if your selection includes some grass, trees, or part of the road beneath the car (we'll fix it soon!)
4. Zoom in around the edges to make sure your selection is fairly accurate. Make the brush Width smaller to help you add any smaller components around the edges.
5. Now look for any areas where the selection includes grass or road or other elements that are not part of the car itself. Try to fix these areas by clicking the Subtract mode in the top-left corner and then clicking on the regions that you want to be de-selected. Remember to change it back to Add mode if you need to revert back to growing the selection again.

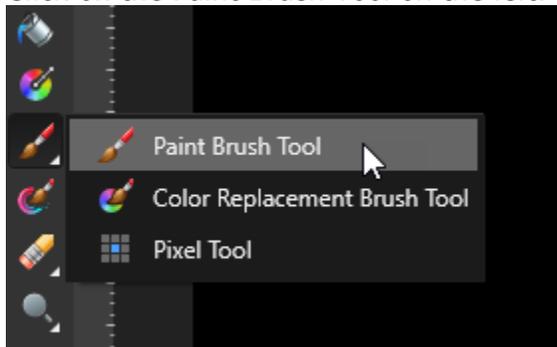


6. The selection doesn't have to be completely perfect but try to make it fairly accurate to include the entire car and excluding grass and road. Don't worry too much about the shadows under the car. It's difficult to completely remove them from the selection so it's ok if some of the shadows are included in your car selection.
7. Once you are happy with the selection, click the "Mask Layer" button at the bottom of the Layers panel.
8. You should now see the car from your selection without any of the background scene.

9. Hold Alt and click on the mask thumbnail beside the image thumbnail in the Layers panel.



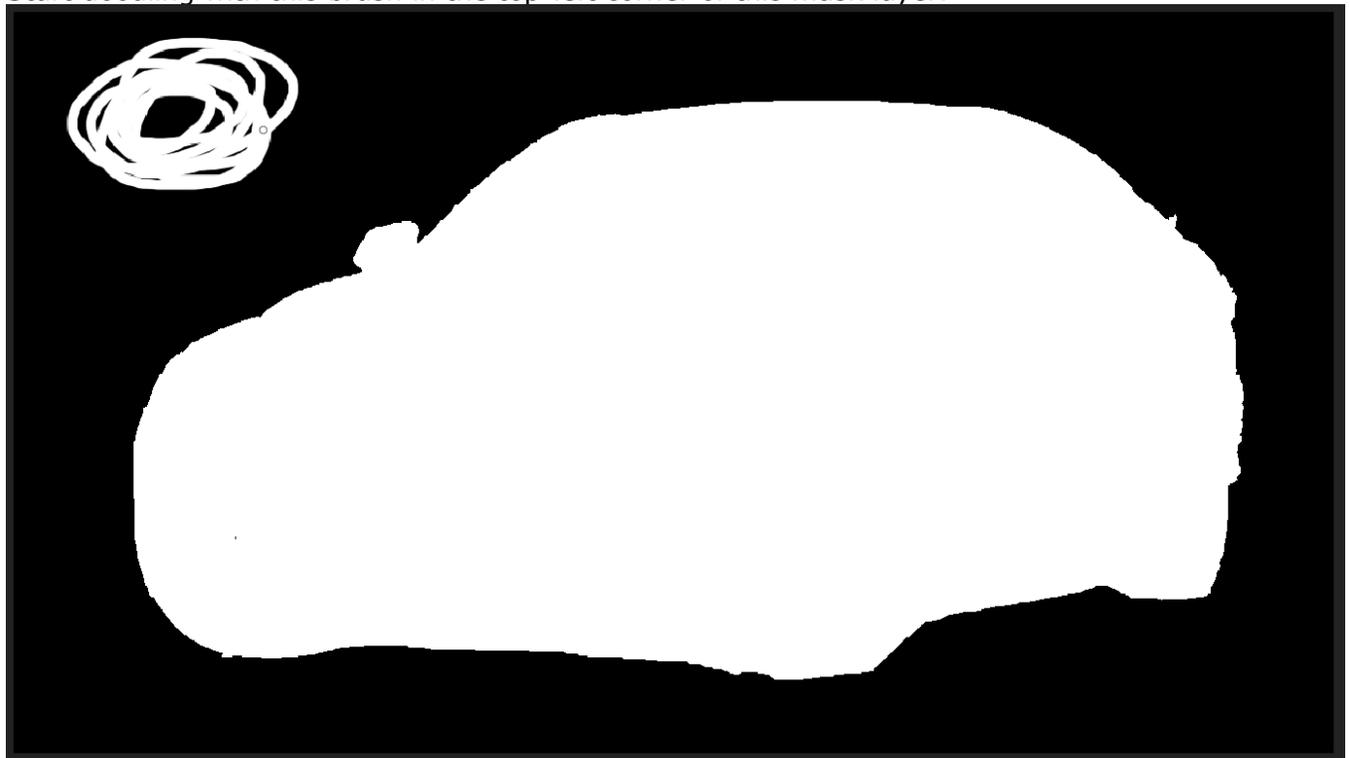
10. In this mode, you see the car selection is shown in pure white and the background is black.
11. Click on the Paint Brush Tool on the left.



12. In the Colours panel in the upper-right side of the program, set your main colour to White.



13. Start doodling with this brush in the top-left corner of this mask layer.



14. Click on the original image thumbnail in the Layers panel to get out of the mask mode.
15. You should see now that some of the trees are showing through onto this doodle you drew!
16. Hit Ctrl+Z a couple of times until the doodle is deleted. Alternately you could go back into the mask mode, choose a paint colour of Black and paint over the doodle.
17. Go back out of the mask mode.

18. Hit Ctrl+A to select the entire image. Then hit Ctrl+C to copy it.
19. Click into the *street.jpg* tab.
20. Hit Ctrl+V to paste the car into a new layer in this document.
21. Hit Ctrl+D to de-select the pasted car.
22. Then you should be able to click down and drag the car to the lower part of the background image so that it's on the road.
23. Save this file into your **cs2033/labs/lab03** folder with the name **ex2_car.afphoto**.

EXERCISE 3: MASKS FOR PARTIAL-COLOUR IMAGES

Here's a preview of what you will be creating in this exercise:



1. Open *boats.jpg* in Affinity Photo.
2. Right-click on the Background layer (the only layer) and click "Duplicate"
3. The new upper copy of the Background layer should now be selected by default. If it isn't, then click on it to select it now.
4. Click the Selection Brush Tool and set the brush Width to 25px.
5. Click the mouse down in the red regions of the middle boat and drag it around to grow the selection to include all the main red parts of the boat.
6. Most of the boat should be easily selected as you drag the Selection Brush Tool around. Some areas might be difficult to include in the selection initially, like the bottom-left portion (shown with the red arrow in this image). You also may get parts of the boat in the selection that should not be selected, like part of the white bottom region here (shown with the yellow arrow in this image).



7. Use a smaller brush size (around 10px) to help select the smaller areas like the one shown above. Zooming in is also helpful for this.
8. Use the Subtract mode and click on the white bottom to help remove such areas from the selection. Don't forget to go back to Add after you finish this step!

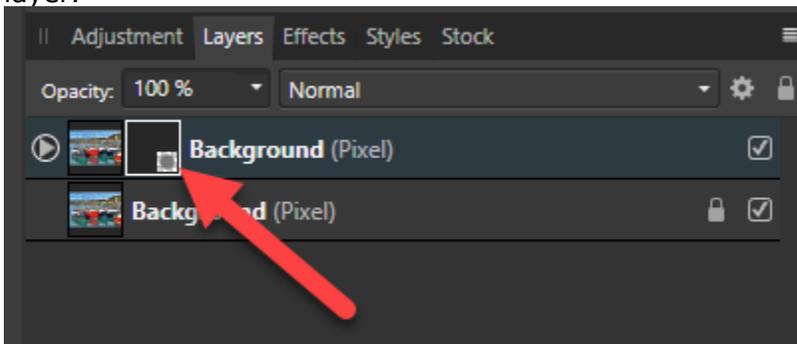
9. Eventually you should have this entire red region selected pretty accurately (don't worry if it's not perfect but it should be pretty close to this).



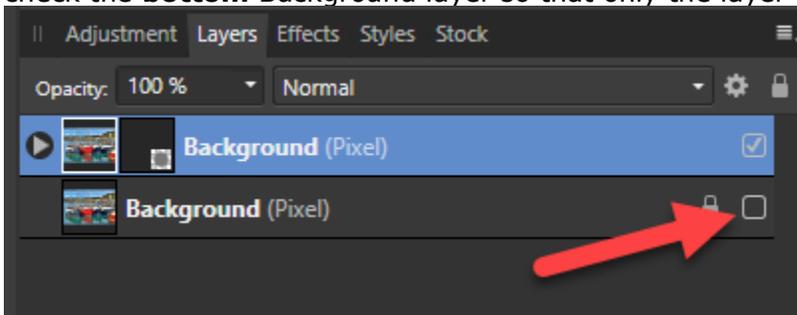
10. NOTE: The rope that cuts in front of this boat is part of our selection currently. If you have extra time and determination, try using the Subtract mode and a very tiny brush size to remove the rope from this selection. This step is not required for this lab though!
11. When you are happy with your selection on the boat, click the Mask Layer button under the Layers panel.



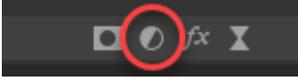
12. Hold Alt and click on the new mask thumbnail beside the original coloured thumbnail for this layer.



13. Notice the boat shape is white and the background is black. This means that the boat shape is the "visible" area while the rest is the "hidden" area. To help you understand this, uncheck the **bottom** Background layer so that only the layer with the mask is visible.



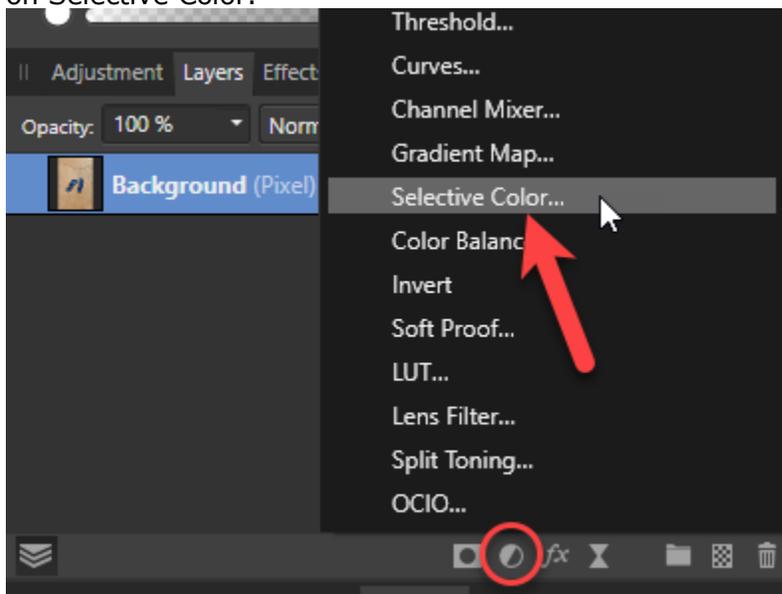
14. You should see now that the red boat that you selected is visible and everything else is completely removed! This is because the mask is controlling which part is visible and which is removed.
15. Check the box again to make the other layer visible again.
16. Hit Ctrl+D to deselect (release the selection).
17. Click the bottom Background layer (the one without the mask).
18. Click the Adjustments button (half moon icon) under the Layers panel.



19. In the Adjustments layer, click on "Black and White..."
20. A pop-up window may appear with different coloured sliders. Click the X to close that window.
21. Your image should now be in all black and white except the red boat showing its bright colour from the upper layer with its mask.
22. Save this file into your **cs2033/labs/lab03** folder with the name **ex3_boat.afphoto**.

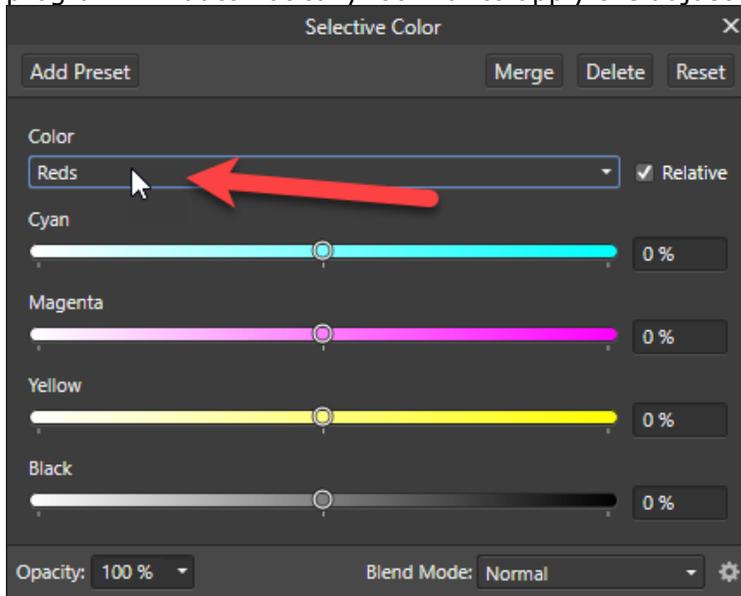
EXERCISE 4: RECOLOURING IMAGES

1. Open *beach.jpg* in Affinity Photo.
2. At the bottom of the Layers panel, click the Adjustments button (half-moon icon) and click on Selective Color.

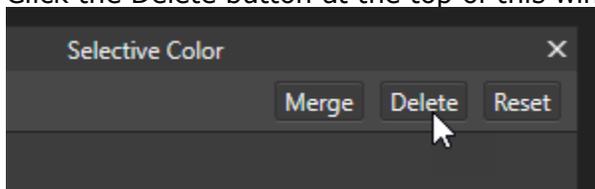


3. You should see a pop-up window with several settings and colour sliders. This is the Selective Color panel and you will use it to experiment with colour adjustments.

- By default, the "Color" menu should be set to "Reds". This refers to which colour the program will automatically look for to apply the adjustments to. Leave it at "Reds" for now.



- Drag the Cyan slider back and forth and look for changes in the pixel colours in the image. Which part(s) of the image are affected (if any)? Think about why this is the case, and why the other region(s) are not affected in this way.
- Revert the Cyan slider back to 0% in the middle.
- Repeat the last 2 steps but with the Magenta slider. Then do the same with the Yellow slider and then with the Black slider. Remember to revert each slider to 0% after experimenting with it.
- Now switch the Color menu to "Blues" instead of "Reds".
- Repeat the above steps of experimenting with each slider one at a time and think about why the pixel colours are being adjusted for certain regions but not others.
- Switch the Color menu now to "Greens".
- Again experiment with each of the sliders individually to see what happens. Think about the reasons for this.
- Click the Delete button at the top of this window to remove the adjustment layer.



- Click again on the Adjustments button and then click on Lens Filter.
- Click on the Filter Color rectangle in the pop up window for this adjustment. This will bring up a little colour picker pop up panel.
- In this new pop up panel, click around on various colours and see how they affect the overall appearance of the beach image.
- Click Delete on this Lens Filter window to remove this adjustment layer.
- Now click on the Adjustments button and select Black & White.
- The picture is now in grayscale (or Black & White) and a panel should have popped up with several colour sliders on it.
- In this popup window, drag the Red slider back and forth. Observe which region(s) of the image change as you change the red slider.
- Revert this slider to 100% in the middle (NOT 0%!).
- Repeat these steps with each of the other sliders in this panel. Remember to revert each slider back to 100% after experimenting with it.
- Think about how each slider affected specific regions of the image and why this occurred.
- Does this tool remind you of another adjustment tool?

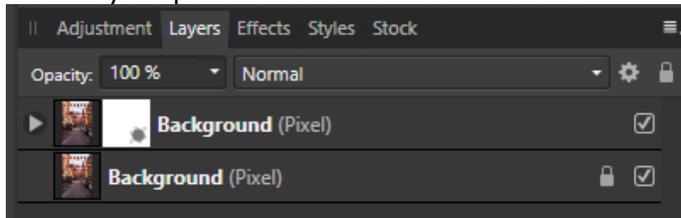
24. Click the Delete button on this popup window to remove the adjustment layer.
25. Click the Adjustments icon again to open the long list of available colour adjustments. Find and try applying 5 different adjustments (other than those done already in this exercise). For each one, experiment with the sliders or other settings in the popup window for that tool. After experimenting with each one, delete it so that those effects are removed.

EXERCISE 5: GRADIENT MASKS

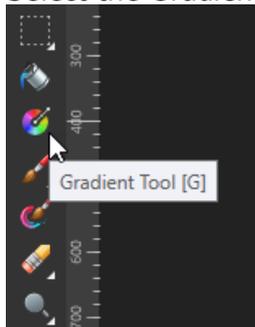
Here's a preview of what you will be creating in this exercise:



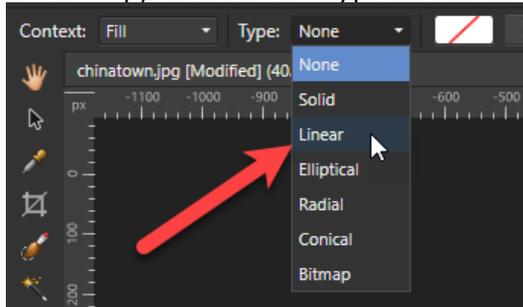
1. Open *chinatown.jpg* in Affinity Photo.
2. In the Layers panel, right-click on this Background layer (the only layer currently), and select "Duplicate".
3. The upper one of the two identical layers should be selected. If not, click on it to select it.
4. Click the "Mask Layer" icon to create a mask of this layer.
5. Your Layers panel should now look like this:



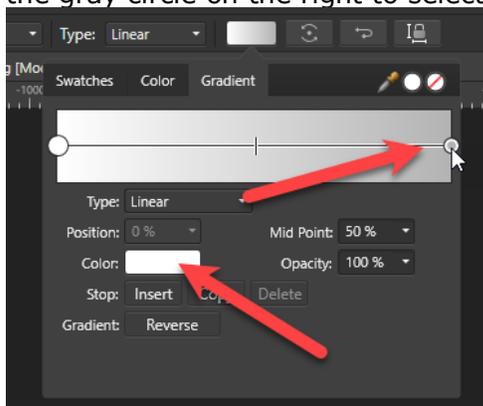
6. Enter the mask mode by holding Alt and clicking onto the mask thumbnail (white square).
7. The mask is currently all white, meaning that everything is visible.
8. Select the Gradient Tool on the left side.



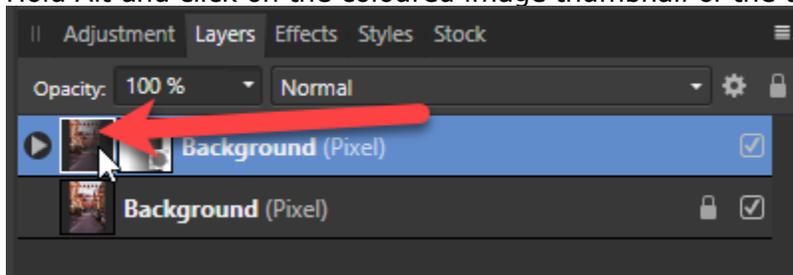
9. At the top, click on the Type menu and select "Linear"



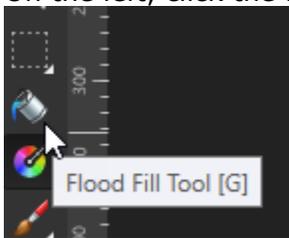
10. Upon clicking "Linear", your mask may automatically have a subtle gray gradient added to it. Just ignore that. We will be overwriting it with our own gradient shortly.
11. At the top, beside the Type menu you just used, there is a coloured rectangle showing the gradient being applied to the mask. Click on that rectangle to open a popup window.
12. In this window, you will likely see one side of the gradient as white and the other side as a light gray. The white part will remain but we need to change the light gray to black. Click on the gray circle on the right to select it. Then click on the Color button and select Black.



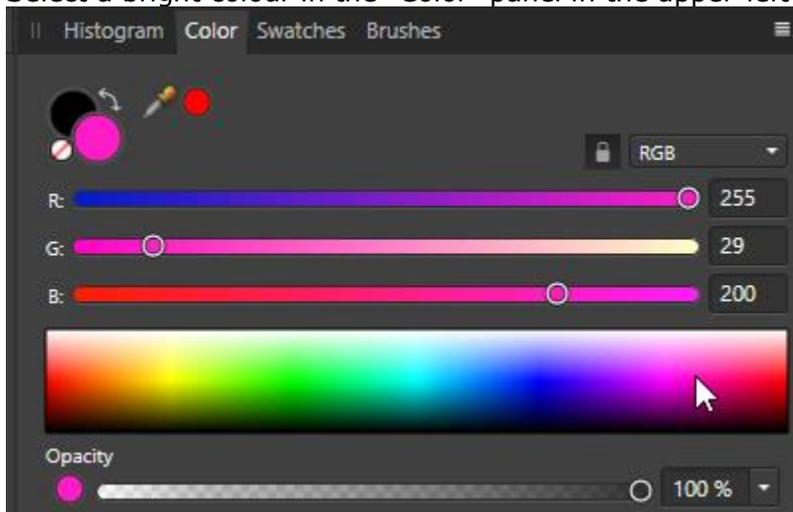
13. Click out of this window to hide it and return to the main picture mode. Note that a horizontal gradient of white to black will be automatically added in the mask.
14. Hold Alt and click on the coloured image thumbnail of the upper layer.



15. Notice that the left part of the image is clear and opaque and that this fades into transparency towards the right part of the image. This is because the mask was white (visible) on the left and black (hidden) on the right.
16. Click on the lower Background layer now (the one that does not have a mask).
17. Under the Layers panel, click the half-moon icon to open the Adjustments list, and select "Black and White". Hit the X of the popup window that comes up with coloured sliders.
18. Notice that the right part of the image is in black and white, while the left is still in full colour. Why is this occurring?
19. After observing this and thinking about why it occurs, right-click on this "(Black & White Adjustment)" layer and click Delete.
20. Click the checkerboard icon under the Layers panel to add a new, empty pixel layer.
21. On the left, click the Flood Fill Tool (paint bucket icon).



22. Select a bright colour in the "Color" panel in the upper-left corner.



23. Click anywhere on the canvas (make sure you have the new pixel layer selected) to paint it all in the chosen colour.
24. Observe that the right part of the image has this colour but the left side does not, with the gradient in between. Why is this occurring?

EXERCISE 6: PRACTICE PROBLEMS

These practice problems are not explained step-by-step like the previous exercises. Instead, you have to apply what you learned to create the images shown below.

- a) Use *cabs.jpg* as a base to create the image below.



- b) Use *monks.jpg* as a base to create the image below.
Hint: do not try to paint all these robes yellow! Use one of the adjustments shown to you above to do this all at once.



This concludes this lab session. Call your TA over to check your work and receive your mark for this lab.

REMEMBER TO REMOVE YOUR MEMORY STICK FROM YOUR MACHINE AND PUT IT IN YOUR BACKPACK! (don't forget it)! 😊