

Activity 1.1.6 See-through

Introduction

Think of some times that you have used an image you found on the web or captured with a camera to create a document, an invitation, a presentation, or anything else. Did the image behave the way you thought it would when you pasted it into your product? Did any of the modifications you made to the image have surprising effects? Have you ever noticed blurriness in an image, or noticed pixelation like you see in the image of the giraffe? What causes an image to be so large that it takes forever to download? All these experiences are related to how an image is represented by a computer.



Materials

- Computer with browser
- Android device with AI Companion
- Google ID

Procedure

1. Form pairs as directed by your teacher. Meet or greet each other to practice professional skills. In the first two parts of this activity you will be discussing ideas and writing collaboratively. Set team norms about contributions to discussion and about collaborative writing.

Part I: Representing Images

2. How is a single color represented in a digital image? Discuss with your partner and collaboratively write an explanation.
3. How is an image represented? Discuss with your partner and collaboratively write an explanation.
4. Name some of the file extensions for images and provide more information about one or two of them.
5. (Optional enrichment.) How does compression reduce the number of bytes needed to represent an image? Discuss with your partner and collaboratively write an explanation.

Part II: Creative Commons, Copyright, and Open Source Software

6. You take a picture and post it on a social media site. Who owns the picture? Discuss with your partner and collaboratively write an explanation.
7. You find a picture on the web, modify it, and include it in a game you have made. Under what circumstances is this acceptable? Discuss with your partner and collaboratively write an explanation.
8. In the next section, you will be using GIMP, a free open source software (FOSS) package for working with images. It competes with Photoshop, a proprietary software package from Adobe. Describe the differences and similarities between how FOSS and proprietary software are developed, distributed, and maintained.

Part III: Creating a Sprite

9. Obtain a digital image on your computer. This might be an image you download or a picture you take.
 - a. Record the filename.
 - b. Record the source. Use APA style to write the reference.

For your own work, APA style looks like this:

Johnson, Sabrina. (2015). *Dog and cat* [Image]. Unpublished work.

For a downloaded image, APA style looks like this:

St. Armant, Martin. (2009). *Incan roof* [Image]. Retrieved from:
http://commons.wikimedia.org/wiki/File:87_-_Machu_Picchu_-_Juin_2009.jpg

- c. Record the license of the image. This might be "Creative Commons 3.0-SA" or "Copyright, permission required for uses other than fair use."
10. Launch GIMP. Open your file using **File > Open**.
11. Choose a portion of your image that you can use as a sprite in an App Inventor app. Select the portion of the image with the following steps.
 - a. Activate the freehand/polygon selection tool using **Tools > Selection Tools > Free Select**.
 - b. Select the region to be used in the sprite. Clicking will create new vertices. Clicking and dragging will draw freehand or (if the click is on an existing vertex) will move a previously created vertex. To finish, complete the selection region by clicking on the first vertex you created.

The escape key ESC will abort a selection region in the middle and you can start again. Once a region is completed, you can start over using Ctrl+Z to

undo the selection; the free select tool will remain activated and you can try again.

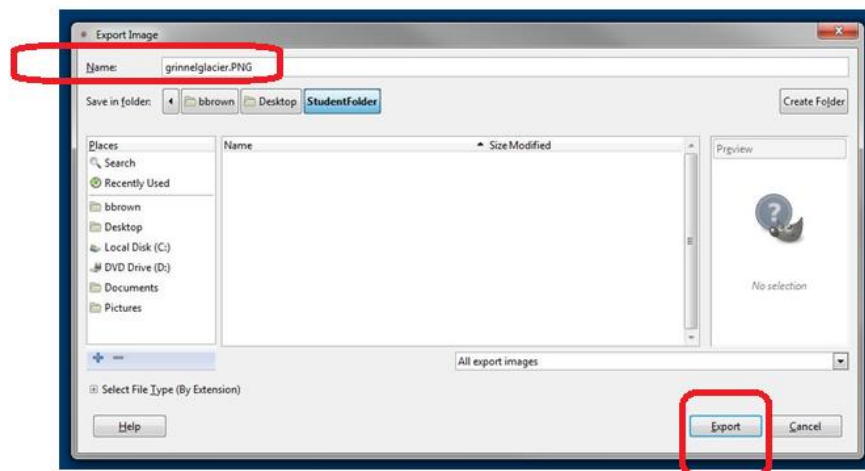
12. Make the rest of the image white as follows:

- a. Choose **Select > Invert**.
- b. Press the **Delete** key.

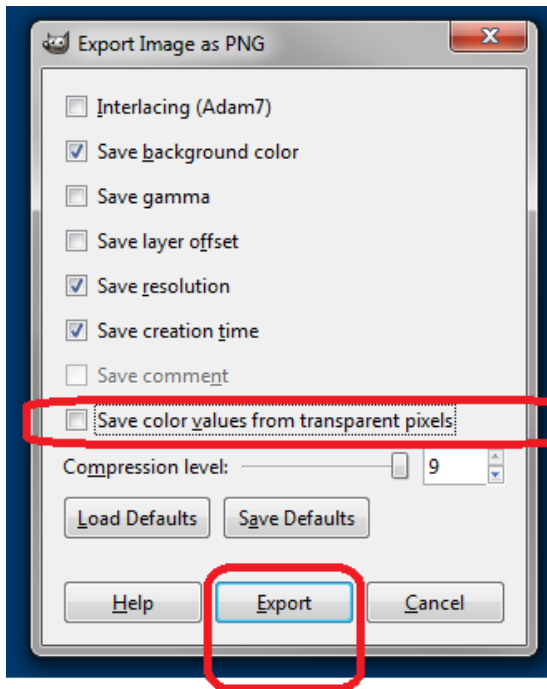
13. The area outside the sprite is still selected. Make it transparent by clicking **Layers > Transparency > Add Alpha Channel** and selecting **OK** to accept the default to change white to alpha. **Then Click Delete** This will create an alpha channel for the entire image and set the alpha to 0 for all white pixels in the selected region, making it transparent.

14. Save your sprite as follows.

- a. Select **File > Export As...**
- b. In the Export Image dialog box, navigate to the location where you will save the file and fill in the **Name** with a filename that ends with the .PNG extension. Then select **Export**.



- c. In the Export Image as PNG dialog box, you can **uncheck** the box for "Save color values from transparent pixels" and select **Export**.



Conclusion Questions

1. You have learned about digital representation of both images and sound. What do the representation of sound and images have in common? What is totally different between the two?
2. Individually reflect on the discussion of ideas you experienced with your partner. Estimate the percentage of the speaking time each of you spoke. Describe the factors that you think contributed to the distribution of the speaking time being what it was.
3. Describe your writing process for creating the collaboratively written responses in the first two parts of this activity. What was most effective about your method, or what suggestion would you make to yourselves that might improve your collaborative writing?
4. You used GIMP to modify an image. Describe how the representation of the image was changed in terms of pixels, RGBA, resolution, memory size, and bits.
5. Who owns the image that resulted from your work in GIMP? What are you allowed to do with it without anyone else's permission?