



Projects

Hair today, gone tomorrow

Give people funny hairstyles by creating a web app with JavaScript



Step 1 Introduction

Write an online app to give people funny celebrity hairstyles with JavaScript!

This resource is based on an original idea (<https://www.youtube.com/watch?v=ghH49ngPFo0&feature=youtu.be>), by winning Pioneers team PiCymru for the Make us laugh challenge.

What you will make

Use the sliders to move and shape the hair in order to position it on the person's head.

What you will learn

This project covers elements from the following strands of the Raspberry Pi Digital Making Curriculum (<http://rpf.io/curriculum>):

- Combine 2D and 3D assets in the assembly of a project (<https://curriculum.raspberrypi.org/design/builder/>).
- Apply basic programming constructs to solve a problem (<https://curriculum.raspberrypi.org/programming/builder/>).
- Engage and share with the digital making community (<https://curriculum.raspberrypi.org/community-and-sharing/creator/>).

Additional information for educators

If you need to print this project, please use the printer-friendly version (<https://projects.raspberrypi.org/en/projects/hair-today/print>).

Use the link in the footer to access the GitHub repository for this project, which contains all resources (including an example finished project) in the 'en/resources' folder.

Step 2 What you will need

Hardware

- A computer capable of accessing the trinket.io (<https://trinket.io>) website

Software

This project can be completed in a web browser using the following sites:

- trinket.io (<https://trinket.io>).
- Pixlr image editor (<https://pixlr.com/editor/>), which requires Flash player (<https://helpx.adobe.com/flash-player.html>), to be enabled and unblocked

If you have other image editing software which supports layers and transparency (e.g. GIMP, Inkscape, or Adobe Photoshop), you can use that instead of Pixlr.

Additional resources

- Photographs of celebrities with hairstyles you like, or other appropriate images

Step 3 Find an image

To begin, you will need to find two images: an image of a celebrity or person with the hairstyle you want to use in your project, and an image of the person you want to give the hairstyle to.

When you are looking for an image, you need to think about:

- How large the image is – images that are too small will not look good
- Whether you have permission to use the image

For example, here you can see three images. The image on the far left is clear, and the subject was obviously aware that the photo was being taken. The centre image is of a low quality and heavily pixelated. The image on the right was taken without the subject being aware that he was being photographed, and he would probably not consent to its use.



- A good place to look for pictures online is Wikimedia Commons (https://commons.wikimedia.org/wiki/Main_Page), where there are lots of images available under a Creative Commons license.



Finding images with permissions to use

Because of copyright law, you cannot use everything you find on the web. Here you will learn how to find images that you can use in your digital making without breaking copyright laws.

Understanding copyright law

Copyright law is designed to protect creators of artistic, literary, musical, and dramatic works from having their work exploited or misused. This means that copyright law applies to all manner of materials offline and online, including images and art work.

Anyone who uses a copyrighted work without the owners' permission is guilty of copyright infringement. This is sometimes true even if a lot of things have been changed about the work.

Many images on the internet are protected by copyright. The copyright symbol © does not have to be present in the image for copyright to exist.

If you want to use an image for which you require permission, you will need to obtain permission from all the copyright owners. Otherwise, you can search for images that are free for you to use through Creative Commons licensing.

Creative Commons

Creative Commons licensing allows the creator of an image to select which permissions they want to give to people to their work for free. With Creative Commons licensing you can give away all rights to your work, or just some of them. There is an online form on the Creative Commons website (<https://creativecommons.org/>), that helps you to figure out exactly which of your rights you want to give away.

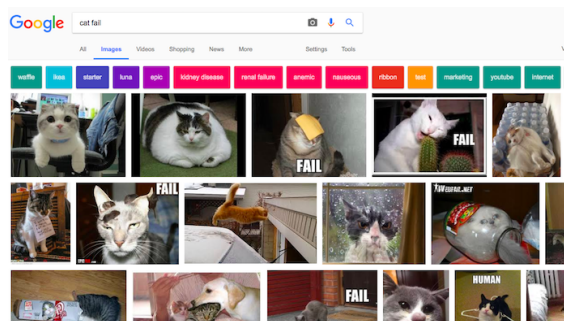
Creative Commons licensing makes it easier for people to find images that they have permission to use. On the Creative Commons site, there is a search tool (<https://search.creativecommons.org/>) you can use to find images that have a Creative Commons license. Another good place to look for images available under a Creative Commons license is Wikimedia Commons (https://commons.wikimedia.org/wiki/Main_Page).

Many search engines also feature a way to search for images with a Creative Commons license, so that people can avoid breaking copyright law.

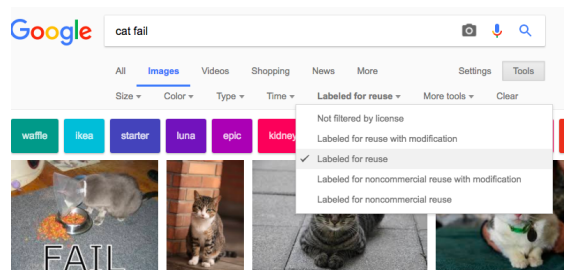
Searching for images with Google

If you are using Google, follow the instructions below to find an image you can use in your digital making:

- Go to Google Images and type in what you are searching for. Here, we searched for **cat fail**:



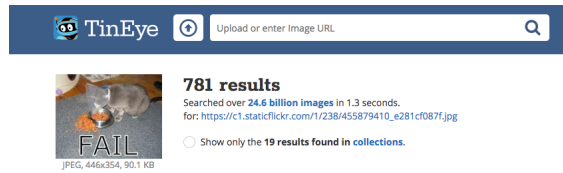
- Click on Search Tools, then Usage Rights, and select Labeled for reuse.



- Choose an image.



- Double-check whether it is free to use. You can use a reverse image search tool like TinEye (<https://www.tineye.com/>) or Image Raider (<https://www.imageraider.com/>), to check for any further usage rights. Here, I copied the image link from the Google search, pasted it into TinEye, and pressed Search. As you can see, the image has been used many times (781!) all over the internet, so it is likely that it is free to use. If in doubt, you should write to the owner and ask for permission.



Online safety

If you accidentally discover an image you find upsetting (https://www.thinkuknow.co.uk/11_13/Need-advice/Things-you-see-online/), close your browser immediately and tell an adult.

Step 4 Edit the hair

For now, we will use this image from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Quiff_hairstyle_-_01.jpg):



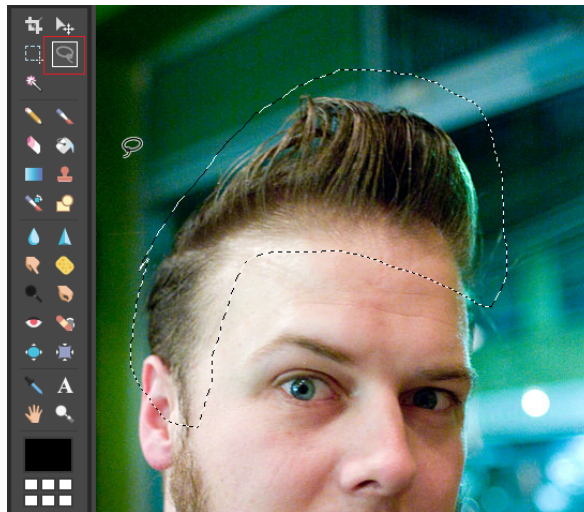
This image has a CC-BY-3.0 license (<https://creativecommons.org/licenses/by/3.0/deed.en>), which means we can use, alter, and share the photo as long as we credit the original person who took the photo. You can credit the person simply by adding their name and a link to the license where you share the image, like this:

By Tim Lucas CC BY 3.0 (<http://creativecommons.org/licenses/by/3.0>), via Wikimedia Commons

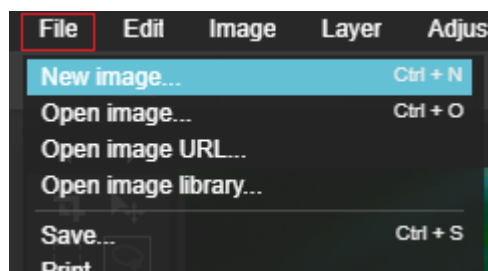
- Choose your two images, one containing a hairstyle and the other a photo of the person you would like to put the hairstyle onto. Save the images into a folder on your computer.
- Open up Pixlr (<https://pixlr.com/editor/>), which is a free online image editor. If you have access to another image editing tool that you prefer, you can use that instead.
- Select Open image from computer or Open image from URL from the menu, and select the image containing the hair style you wish to use, or copy in the url of the image you want to use..



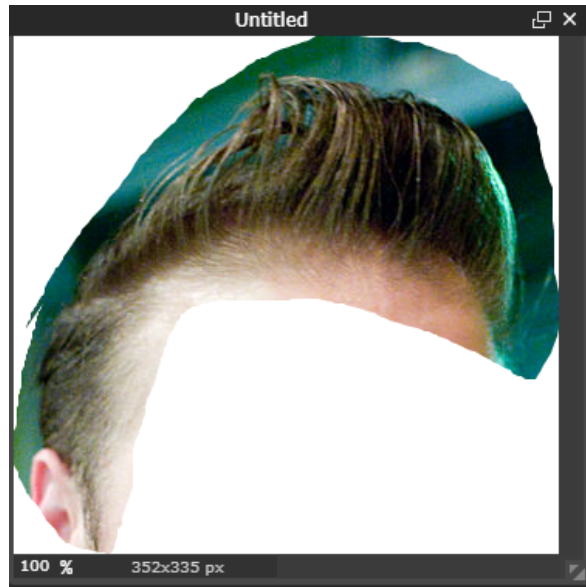
- Using the lasso tool, draw a rough outline around the person's hair. It doesn't matter at this stage if you also get some skin or some of the background – we will remove that in a minute.



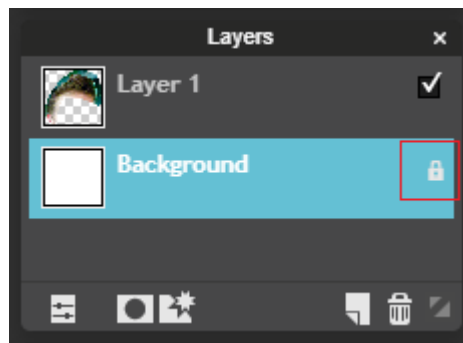
- Press **Ctrl + C** to copy the hair.
- Click **File > New image**, and click **OK** on the box that pops up.



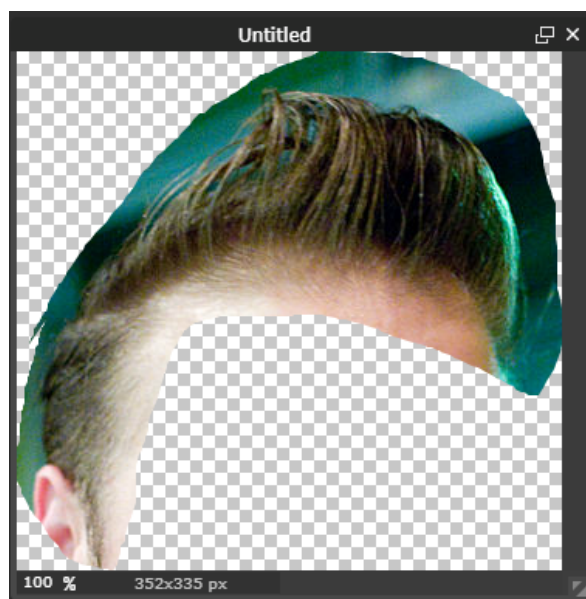
- Press **Ctrl + V** to paste the hair into the new image.



- Now you need to remove the background. In the layers palette on the right, double-click on the padlock next to the Background layer. This will unlock that layer.

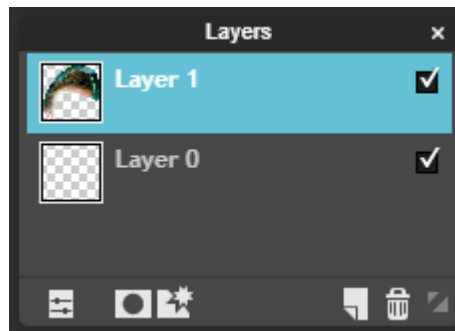


- To remove this layer, press the key on your keyboard marked **Delete** (NOT the backspace key), or go to Edit > Clear on the menu. The background of the image will change to a checkerboard pattern, which means that the area is transparent.

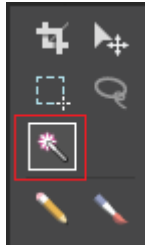


Let's tidy up the messy bits of background around the hair.

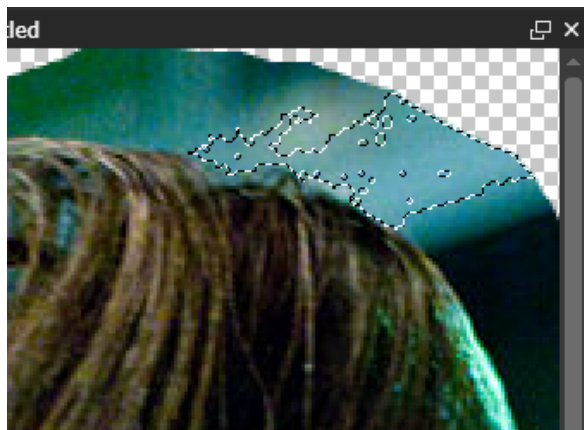
- Switch back to Layer 1 by clicking on it in the layers palette.



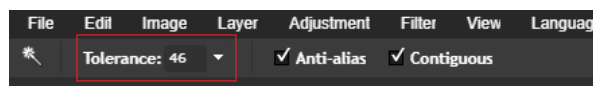
- Select the magic wand tool from the tools palette.



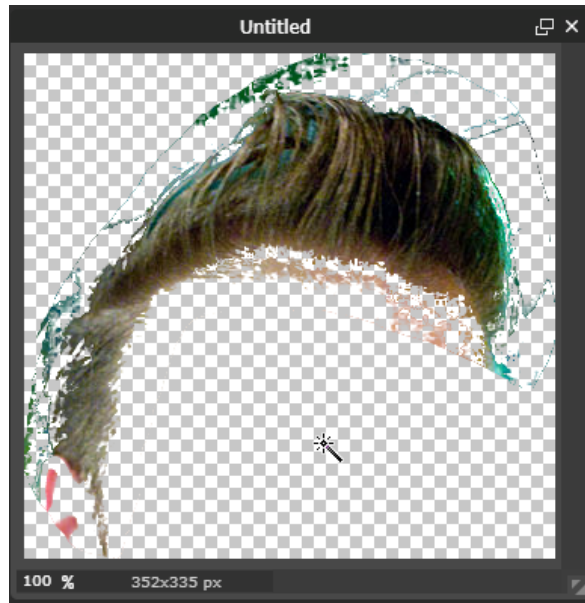
- Click on part of the green background you want to remove. It will become highlighted with a wiggly line around the edge. You can now press the **De**lete key to remove it.



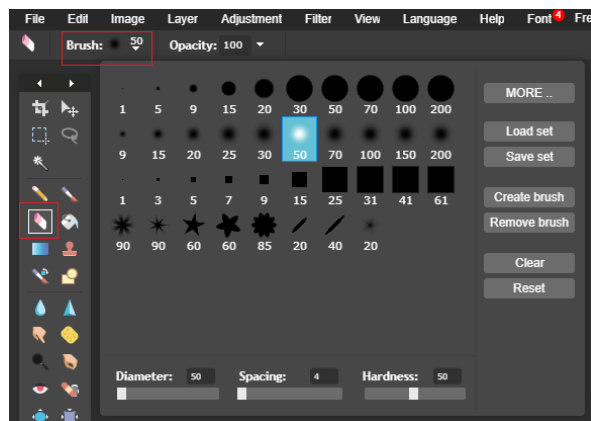
- To make your magic wand select more of the green background, you can change its tolerance setting. A low tolerance means that the wand will only select areas of colour that are very similar to the colour you clicked on. The higher the tolerance, the less strict the wand's selection. Tolerance ranges from 0 to 255.



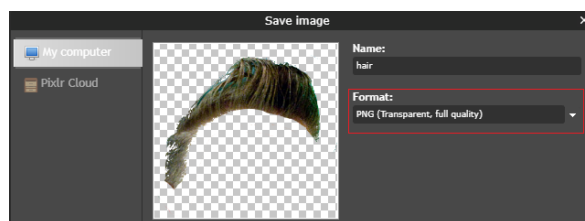
- Remove as much of the background and the skin as you can, taking care not to delete any of the hair. You will be left with a few annoying bits hanging around.



- Press **Ctrl + D** to deselect any areas that might still be selected by the magic wand. You want nothing to be selected, so check that you see no wiggly lines anywhere on the image.
- Select the eraser tool and carefully remove any leftover areas around the hair that the magic wand missed. To make it easier to remove the small bits, you can change the size and shape of your eraser by clicking on the Brush.



- Once you are satisfied, click **File > Save**. In the box that appears, give your file a name. Make sure you select **PNG** as the file type so that your image will be saved with a transparent background.



- You should now have a finished hairstyle with a transparent background.



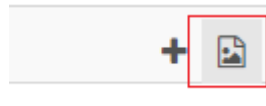
Step 5 Add the images

- Open up the starter trinket `rpf.io/combover` (<http://rpf.io/combover>).

You will see some HTML code in the `index.html` tab and some CSS code in the `style.css` tab.



- Click on the image icon in the top right-hand corner of the code area.



- Click Add image, then Upload, then Click to select files. You will need a free Trinket account to be able to upload images.
- Select the hair image you just made and the image of a face you picked out earlier.

Wait for the images to upload, then make sure that both are selected in green so that you can use them in this trinket.

Make a note of the file names of the images – in this example, we have `face.jpg` and `quiff.png`.

I am using a photo of myself, so I know that I have permission to use it and that I am happy for it to be seen in public on the internet.

- Go back to `index.html` and look at the code on lines 9 to 15.
- Here is a good place to add the image license. You can add a comment in your HTML code between `<!--` and `-->` to place the license text for your image:

```
<div id="hair"> <!-- Hair image by Tim Lucas CC BY 3.0, via Wikimedia Commons -->
  <img src="" id="hair-image">
</div>
```

Where you see `src=""` in the code, you need to add the name of the picture you want to display between the quotation marks.

- Add the file name of your face image between the quotation marks of the first image tag.

```
9 <div id="original">
10 
11 </div>
```

- In exactly the same way, add the file name of the hair image inside the second image tag.

You should see both images appear in the area to the right of the code area. However, the hair might be floating around somewhere!

Step 6 Add a slider

Let's add a slider so that the user of your app can change the width of the hair to make it fit on the pictured person's head properly.

- Click on line 18, which is inside the `<div>` labelled `sliders`.

A `<div>` is an invisible box which can be moved around and positioned on the page.

- Add the following code to create a width slider on your page that allows you to control the width of the hair image so you can fit it onto the head.

```
Width: <input type="range" min="1" max="300" value="50" id="hairwidth">
```

You should see the slider appear below your picture.

If you move the slider at the moment, nothing happens. You need to write some code to tell the page: "When this slider is moved, change the width of the hair."

- Position your cursor between the `<script>` and `</script>` tags. This is where you can write JavaScript code.
- Create a variable called `width_slider`, which refers to the slider you just added, like this:

```
var width_slider = document.getElementById("hairwidth");
```

Notice that the `id` of the slider you just created is `hairwidth`, and now you're using it to select the slider with the help of `getElementById`.

- Below this line, but still within the `<script>` tags, add the following code so that the width of the hair changes whenever the slider's value changes:

```
// When I move the width slider...
width_slider.oninput = function() {
  // Change the width of the hair
  document.getElementById("hair-image").style.width = this.value + "px";
}
```

This code says "When the `width_slider` is moved, select the `hair-image` and set its `style.width` to the value of the slider (`this.value + "px"`). You use `//` to tell your JavaScript code that what follows is a comment.

- Move the slider – as you do, you should see the hair image get bigger or smaller.

Step 7 Challenge: change the height

Can you add another slider to allow people to change the height of the hair image? You will need to follow these steps:

- Create another slider inside `<div id="sliders">` by copying and pasting the code for the width slider. Don't forget to change the label and the `id` of the new slider.
- Between the `<script>` tags, add a variable that refers to the `id` of the slider you just created.
- Add some more JavaScript code to say "When the height slider is moved, change the height of the hair image". You will need to change the code in the two places marked with `???` below. Look at the code you wrote earlier to help you.

```
???.oninput = function() {  
  document.getElementById("hair-image").style.??? = this.value + "px";  
}
```

- Test whether your code works. Can you move the slider to change the height of the hair image?

Step 8 Change the position

Now that you can change the width and height of the hair image, let's also make it possible to change its position so you can perch it perfectly on top of the head you picked out!

The process is almost the same as for the width and height of the hair, with only one small difference. When you changed the width and height of the hair, you were modifying the `` with the ID `hair-image`:

To move the hair around, you will need to modify the `<div>` with the ID `hair` instead.

- Add code for a top slider below to the code for the other sliders – this will control how far from the top of the page the hair image is located.

```
Top: <input type="range" min="1" max="300" value="50" id="hairtop">
```

- Between the `<script>` and `</script>` tags, create a variable called `top_slider` to refer to the slider you just added:

```
var top_slider = document.getElementById("hairtop");
```

- Move your cursor so that it is below this line, but still within the `<script>` tags. Add some code to change the hair's distance from the top of the page whenever the top slider's value is changed. This time we will select the `hair` element instead of the `hair-pic`.

```
top_slider.oninput = function() {  
  document.getElementById("hair").style.top = this.value + "px";  
}
```

Take care to add this new code after the closing brackets of your existing code, rather than inside them.

- Move the slider. You should see the hair image move toward or away from the top of the page.
- Add a `left` slider in exactly the same way: repeat the same steps but replace `top` with `left` everywhere you put it to allow your hair to be positioned at variable distances from the left of the page.
- Use the sliders to position and resize the hair so that it looks like it belongs to the person in the picture.

To save your picture, you can press the **Print screen** button (on a Windows computer) or **Command + Shift + 4** (on Mac). Then paste the image into your favourite image editor to crop and save it.

Step 9 Challenge: rotate the hair

- Can you add a slider which allows you to rotate the hair `<div>`?

You can follow the same procedure you used to add the top and left sliders, but you will need a different command to tell the hair to rotate:

```
document.getElementById("hair").style.transform = "rotate(" + this.value + "deg" + ")";
```

Don't forget that the sliders currently have a minimum value of 1 and a maximum value of 300. How will you need to change this for your rotation slider so that you can rotate the hair in a full circle?

```
Left: <input type="range" min="1" max="300" value="50" id="hairleft">
```

Now you can give the people in your pictures funny beards too!

- Can you add more hair choices? Find another image and edit it to remove the background as you did for the hair, then add it to your trinket. Perhaps this time you could add a moustache or pigtails?

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View project & license on GitHub (<https://github.com/RaspberryPiLearning/hair-today>).