A Guide to Basic Pixel Art Techniques

Spriting is a type of artform - it can look challenging, but a few simple techniques allow almost anyone to make good looking sprites right from the start.

This guide has been written in such a way as to try and cover both advanced image editing programs (like Photoshop) and the basic types (like MS Paint).

 The Photoshop icon marks sections that only apply to PS and similar applications, like Gimp. (Mostly how to get them to behave like MS Paint.)

So what IS a sprite? The generally accepted definition of a sprite is a (normally) small graphic picture, also called pixel art, which has no anti-aliasing or partially transparent pixels, which was created using only the most basic of computer art tools. Any tool which modifies pixels is strictly prohibited - layer effects, automatic shadows, smudging, etc. The principles behind pixel art is that it was all the pixels, the little squares that make up the picture, were deliberately placed.

Getting Ready

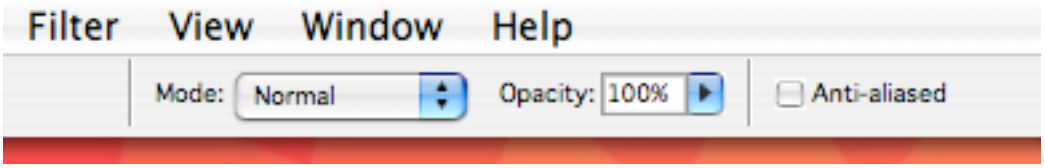
The first thing you need is an art program. MSPaint is a common choice for most people, since it's bundled with Windows. Other possibilities include Photoshop, Gimp and Appleworks (the equivalent of MS Paint for Macintosh users) - any painting program that allows you to place pixels will do. Chances are you've got at least one such application on your computer already. If not, a quick internet search will turn up a number of free alternatives.

I'll be using Photoshop (PS) in this tutorial, but the tools are exactly the same in any other application. If you're not familiar enough with your painting program to recognise these tools, it's highly recommended that you seek out the user's manual and/or a tutorial on basic functions.

Pencil - This is your primary drawing tool.
Eraser - For undoing pencil marks.
Paint Bucket - Useful for filling large areas with colour.
Eye Dropper - Copying existing colours.
Line - Drawing straight lines *
Rectangle/Oval Tools - for drawing boxes and circles. **

* In Photoshop, with the Pencil tool selected, click two points while holding down the Shift key to draw straight lines. This is faster than using the Shape (line) tool.

** In Photoshop, these are the Shape tools. You have to set up a few parameters to make them work correctly for spriting, however. First, Set your Mode to Normal, Opacity to 100%, and turn Anti-Aliasing OFF. (These options are all in the top toolbar when you have the Shape tool (Keyboard shortcut "U") selected.



The Mode, Opacity and Anti Aliasing options for the Shape Tool in Photoshop.

Most importantly, you have to change the Shape tool to "fill pixels" - this is the third box from the left right after the tool select box, right under the Photoshop drop down menu. Photoshop's Shape tools will now behave just like the MSPaint versions.

The behaviour option - fill pixels selected.

Similarly, make sure you have the Pencil Tool (NOT the Brush tool!) configured to 100% opacity.

If you're using MSPaint or a similar application, you can skip all of this boring set-up stuff, as your tools are already set up to work directly with pixels.

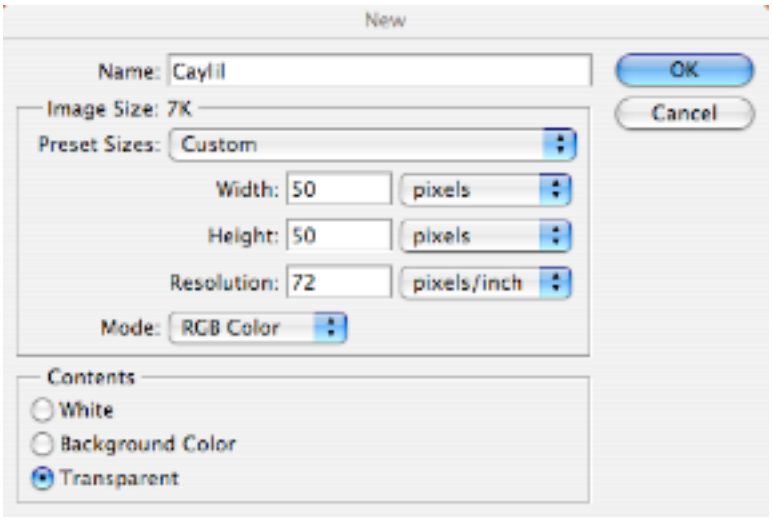
Loving Line Art

Line art is the basic outline which defines your sprite. Think of it as making a colouring book page. The first thing to do is consider what you'd like to draw! When you've picked a subject, it's time to think about size, resolution and point of view (PoV).

Size - How big your sprite is affects the level of detail and how many colours/levels of shading will be possible. A good starting size is 50 x 50 pixels. You can always crop down your canvas or enlarge it later, should you need less or more room
Resolution - With very few exceptions, pixel art is done at the web standard of 72 dpi, or dots per inch. There aren't many reasons to go higher or lower than this.
Point of View - there are two basic categories in pixel art styles; isometric, and non-isometric (flat) - Isometric sprites are drawn from a three dimensional perspective, while non-isometic sprites are usually drawn from the front or side. Non-isometric tends to be more forgiving, so it's a good place to start. Note that three dimensional perspective is not the same thing as appearing three dimensional - all sprites, even non-isometric ones, can have three dimensionally. The example in this tutorial is non-isometic.

Recommended Reading on Isometrics -
http://en.wikipedia.org/wiki/Isometric_projection

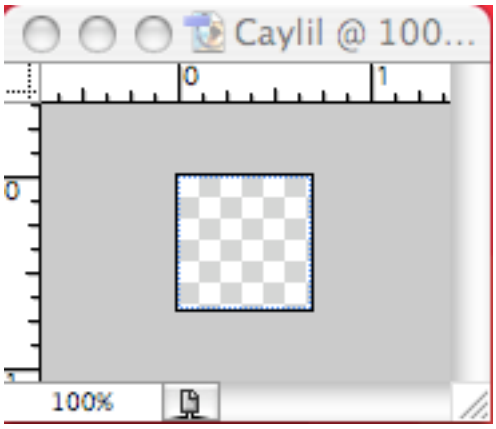
Set up your workspace, defining your resolution and canvas size. Think about what you want to draw, and pick out the largest basic shape. For most creatures, this will be the body or head.



Caylil's canvas is defined in Photoshop.

Now that you've got a canvas to work on, it's time to start blocking in the lineart. My concept idea of Caylil is a roundish body with a dragon tail, two small wings and a very cute face. The body will be the largest part for Caylil, so I'll start with the Oval Shape tool, in black. That canvas is far too small to see easily, so I'll zoom in to make my work easier. Use your magnifying glass tool to get up close. Work in whatever size feels comfortable for you - I usually use between 600%-

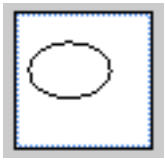
1000% magnification.



A note on line colours - black is a common choice for pixel art outlines, but it isn't the only choice. generally a dark colour is preferred, because it looks good on both light and dark backgrounds.

Back to that Oval Shape tool. I'm going to draw my oval slightly towards the left and up, to leave a decent amount of room for Caylil's tail.

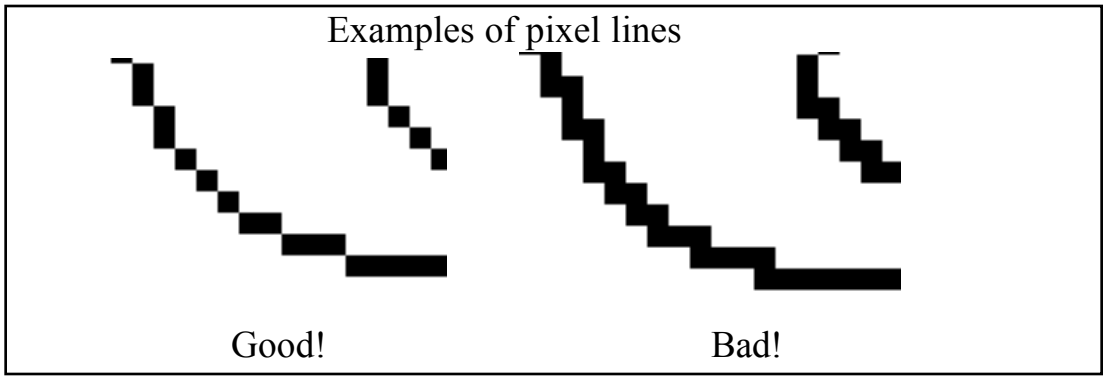
While Photoshop has more shape options than MS Paint and its counterparts, it doesn't draw lines when doing shapes, but makes solid blobs. To



get an outline, select the shape with the Magic Wand, go to the Select > Modify > Contract by 1 pixel, Ok and hit Delete. Another tip to make your life easier is to change your background options to turn off the checkerboard, or simply stick a white layer behind your drawing. It's a good idea to keep an eye on your finished sprite at normal resolution, so open a second view with Window > Documents > New Window, and leave this one at 100% magnification.

Next up is the tail - for anything that's not a circle or rectangle, it's easier to use the Pencil tool. Ew, ugly, right? Don't worry about making just a single line when drawing on parts - you can use the eraser to clean them up as you go along.... like this. Much better. Refine your

basic shape until you're happy with it. Keep adding parts, one at a time to develop your line art. Notice that I "slimmed down" the outline of the tail so that it was only one pixel wide, with no overlap.



Unless you have an area that needs heavy emphasis, don't double up your outline - it makes your sprite look clunky and rough.

Once your outline meets your satisfaction, it's time to move onto the fun part - Colour.

Whee! Lineart done!

Let There be Colour!

Choosing your colours is a very important step. For best on-line results, using the web compatible colour set is suggested. Don't try to incorporate too many colours into your sprite - that can make it look messy. Simple colour schemes work well. Colour theory is a whole other kettle of fish, but you can read about it here: http://en.wikipedia.org/wiki/Color_theory

Suffice it to say that between one and three "basic" colours works best for most sprites. Caylil already has an established colour scheme from Cayalin (the adult form of this creature), so I'm going to stick with that. Choose your basic colours, then find one or two lighter versions and one or two darker versions. Block these out beside your sprite to make a colour palette. Subtle colour shifts can be achieved by not only increasing or decreasing the basic colour, but also the hue. For example, this is what yellow plus it's shades (yellow + black) and tints (yellow + white) look like:

Tints Pure Hue Shades

Not very pretty, hm? The lighter tones of yellow blend well, but it turns to olive green when you add black. Thus, to shade "dark" yellow, it's easier to add red tones... like this.

That looks much warmer, doesn't it? Colours that shade well together generally lie close on the colour wheel - see left. In the example with yellow, orange, the next colour over, was used to replace yellow's own shades to much better results. A colour band for a sprite doesn't need to be only of one hue - you can use multiple side by side hues to good effect as well. Cayalin's colours were chosen

from the bottom left segment of the colour wheel. Essentially, this colour scheme is really only two related hues, plus shades and tints. Red tints and yellow shades are the most difficult to do (yellow turns to olive green, red becomes pink), so those two colour groups should be avoided for your first few sprites unless you've got a strong artistic background.

Once you've chosen your colours, take your midtones (the colour that lies in the middle of your colour range) and Paint Bucket it into the appropriate areas. You'll now have a coloured sprite... here's Caylil again, this time with "flat" colour added.

Shadows and Light - The Art of Shading

Chances are you noticed that I've chosen a slightly darker colour for the feet - that's because in this sprite, I'm imagining Caylil's feet as pointing a bit down, with the light source behind it, so they'd be in shadow. This is important. Take something on your desk, stick it under a table lamp, and think of what colour it is. Now *really* look at it. Is it all one colour? Chances are that it's not. Around the base of the object, it's much darker, almost black even. The top might be close to white, depending on the intensity of the light source. This is the difference between a good looking sprite and an amazing one - shading.

There are many types of shading - pillow embossing, dithering, ragged edge texturing, and many more. Some of my favourite tutorials in different shading techniques can be found here: http://ssn.sonicstadium.org/tutorials/home
While these are aimed specifically at Sonic and friends sprites, the techniques taught apply to any type of sprite work. In this tutorial, I am only going to present the technique I use, which I call Light/Shape Sensitive Shading. (LSSS)

LSSS works best with 5-7 colour shades for large areas (40-80 square pixel canvas size). Smaller canvases need fewer colours, larger ones need more. I'm going to begin with Caylil's head/body part, since it's the largest. The basic colour is already blocked in, so I'm going to choose the next higher (lighter) colour and begin adding the highlight. It helps if you keep the shape and the imaginary light source of your sprite in mind. Caylil's round, so I'm going to shade it to match.

It is probably hard to see in this regular size screen capture, but I've left a small border of the original base colour around the top of the eyelids for shading. Take a look at the close up for a better view.

The next lighter colour goes on the same way, leaving more of the darker colour towards the bottom, as my light source is above Caylil. Finally, I added white as the highest highlight, just over the top of Caylil's head above it's eyes. A line of darker pixels go under the mouth and bottoms of the eyes for depth. Starting to look good.... Moving right along, I'm going to add the shading to the head/body now. Take the first shade after your midtone colour to begin with. Add it to the bottom of your area, working around from one side to the other. Leave some of the midtone visible, but put in enough of the shaded area that you have room for your other shade(s), because they will go on top of the first one. I started by outlining the edge of the feet where they met the body, and the bottom of Caylil where the tail joins. Next, these toned areas are beefed up. Then the darkest shade in my five colour set is added to the deepest parts, where the feet and body touch, mostly, the corners of the eyes, etc. The eyes are done in much the same way, with a lighter tone closer to the main highlight (white shine) of the eyes, and darker shades towards the corners. Body done!

While PS doesn't do shape outlines as well as MS, it does have a few extra tools which come in very handy. My favourite for spriting of these is the Magic Wand (keyboard shortcut "W") Click on your basic colour so that you can paint without obliterating your outline. This saves time as you don't have to be nearly as careful about the border. Alternately, you can duplicate your colour layer and leave the outline on its own.

Next up is the tail. This is going to require a slightly different method. Think about how your sprite is positioned. With Caylil, its body would be blocking the tail from most of the light, so the edges will be lighter than the middle. I'm going to work from the edges inward, for this section... like this. Note how the edge highlights end where the lowest part of the tail is, and from there only the top part has been left the base midtone. With small areas, you have to

use fewer colours to shade with - there simply isn't space for a full range of colours. Where the areas taper to three or less pixels wide of colour area, like the narrow half of Caylil's tail, highlight and shade sparingly and don't try to apply gradations in both directions - the area will turn out too light or too dark.

The tail is done, moving onto the feet. These are shaded exactly like the body was, only starting with one colour darker than the body as the midtone. A single line along the top edges of the foot makes for the highlight.

Very little highlighting will be added to the feet, because they're not exposed directly to my imaginary light source, much like the base of the tail.

With the darkest shade, a line across the pad of each foot defines it more clearly. These are then shaded outwards with the next lightest colour. The base of the feet are finished off with standard shading.

Wings and claws are the only areas left - I'll tackle the wings first. Like Cayalin's wings, Caylil's are slightly stylised - darkest shade at the top, lightest tone at the bottom with the entire range in between. Only time and practice will let you accurately gauge how thick each section needs to be in order to look right, but don't be afraid to keep painting over your sprite until you're happy with the shading. The outline is followed with the darkest shade, then the next lightest, and so on. Where there is not enough room for all the shades, stick with the ones closest the midtone and drop the darkest/lightest colours. Note that the bottom edge of the wings isn't shaded from the black outline - this helps mimic the shape of the wing more accurately. When you're not sure about how to shade an area, try finding an object that's similar in shape and hold it under a lamp to study where the highlights and shadows go. A little blue to brighten up the claws... and Caylil's all done.

Time to Show the World

All done, right? Wrong. This is where a lot of beginners trip up - file formats. There are only two "proper" file formats for sprites - PNG or GIF. JPEG, in particular, is to be avoided at all costs! This is because jpg's are a lossy format - they do not save the individual pixels, and distort the final work to unacceptable proportions. Colours are also changed by saving in JPG format. BMP's (bitmaps) are also a lossless format, but they are poorly supported and are at best a third choice to PNG and GIF.

Which of the two you choose, GIF or PNG, doesn't make much of a difference. PNG usually has a smaller file size, but its transparency is not well supported on some older browsers (like Internet Explorer). Since sprites are so small anyway, size considerations are rarely a problem. Once you've got your file in GIF or PNG, simply upload it and share with the world. Congrats. Your on your way to becoming a spriter. Why stop at one sprite? There's a world of possibilities out there, just waiting to take shape.

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