Pixel Art Shading Techniques

There are as many different ways of shading as there are artists who create pixel art. That being said, shading techniques fall into several broad categories. I'll be doing my best here to demonstrate some of the more common ways of shading.

Pillow Embossing

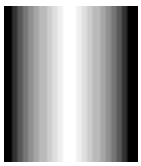
This is a good basic technique to try out when you're first starting. Here's a basic shape that will be used for all the examples to follow: You can find your own copy called diamond.gif in the Projects folder that accompanied this tutorial, if you'd like to follow along.


Oooh... shiny! o.o

Pillow embossing is quite simple. First, you'll need to open your line art in the paint program of your choice. The sample file is accompanied by a small five colour band (white through mid grey) but you're welcome to use any colours you'd like. To start, choose any area of the sprite and get your pencil set up with the darkest colour in your palette. Outline the area towards the inside with a single line of your colour. When that's done, pick out the next lighter colour, and repeat, moving ever inwards. That's all pillow embossing shading is - it's very simple, if a bit slow for large or complicated areas. Here's the whole diamond shaded with pillow embossing.

Now for the drawbacks of pillow embossing - while it's easy to do, it doesn't look very realistic, does it? The smaller your area, the darker it turns out, which can spoil the effect. You can improve the appearance of a pillow embossed sprite by adjusting the starting point of your colour range. Here's the same sprite, with the smaller upper triangles done in the lightest three shades instead of the darkest three. Not bad. You can further improve on the basic pillow embossing technique by thinking about the shape of your sprite. The diamond drawn here in profile is round when seen from the top, meaning that the left and right edges would not be evenly coloured.

Take a look at the grayscale cylinder at right. See how the edges are darker than the centre? Let's try applying this principle to the diamond. Starting with the top, the leftmost and rightmost triangles are returned to their darker appearance from before.



A bit better... lets see what happens when the centre long triangle that forms the point is lightened up to match the top diamond above it. Looking good. This is about as realistic as you're going to get with pillow embossing - try to allow for the shape of your object by choosing a darker or lighter set of colours from your band. Things that are round or amorphous often look quite good when shaded with pillow embossing, especially with a fairly large colour band.

Exercises to Try:

1. Try shading the entire top of the diamond (5 small triangles) and the bottom of the diamond (3 long triangles) together as one area with the pillow embossing technique.

2. Try varying your colour range across each area from top to bottom to see what effect you get. What happens when you put darker shades near the top, or bottom, instead of around the edges?

3. Try inverse pillow embossing. Instead of starting with the darkest colour for the edge, use the lightest and work inwards with darker colours.

Colour Choice

Tone, value, tint, shade - Colour. Even a simple white/greys/black colour scheme can transform a sprite dramatically, as you've seen in the pillow embossing tutorial. Colour is all important when building a sprite. But how do you go about choosing your colours? Even if you know the basic hue desired for your sprite (a yellow lemon, a brown branch, a pink bow) how many values, or variations on that hue do you need to colour your sprite?

Only practice will make it easy to determine this, but a general rule of thumb is the rounder and fatter your sprite has to look, the more shades and tones you need. The greater your contrast, the difference between your lightest and darkest colour, the more three dimensional your sprite will look. This has to be balanced against what looks good - high contrast does make things "pop" from the page, but it can

also make them look jaggedy and rough if there are not enough gentle graduations in your colours to fool the eye into seeing a blend instead of separate areas.

Building a Colour Band

There are two basic approaches to building colour bands. You can start with either end, such as a dark shade or black, or a light shade or white, and gradually shift towards the other end, or you can begin with a midtone, and work outwards.

Either one works well, though beginning with the midtone is usually easier for beginners since the midtone is the colour the viewer will usually say the area is. For example, the circle on the left has both black and white in it, but it appears to be grey, because most of the shades and tints in it are grey.

Firstly, decide how many colours you are going to need. Very small sprites require few, while larger ones need more. A good starting number is five or seven for most projects. It's often helpful if you don't go all the way to black or white on either end, since if you discover that you need more colours, you can add them to the top or bottom of your band.

Make a small square of pixels to one side of your lineart with your midtone, no more than two or three pixels square - just enough to be easy to pick up with the Eye Dropper tool at magnification. Change to a lighter colour and repeat, then return to your midtone and do the darker colours. You should end up with something like this:

A colour band next to line art, ready to be used.

Sample Colour Bands

White to Black

The most basic of colour bands, pure white through black with various shades of grey in between.

White to Vivid Green (Tints only)
An eye searing bright green with more and more white added to it for each colour box. While there are variations in the boxes towards the right, they are difficult to see and would not show up well in a sprite if used.

White to Dark Green (Tints and Shades)
This band is simply white with more and more green and black added to each new colour square.

White, through Green and blue (Tints only)
These colours were picked from only pure hues and tints, no black in any of the colours. Notice how vivid (almost glaring) this band appears.

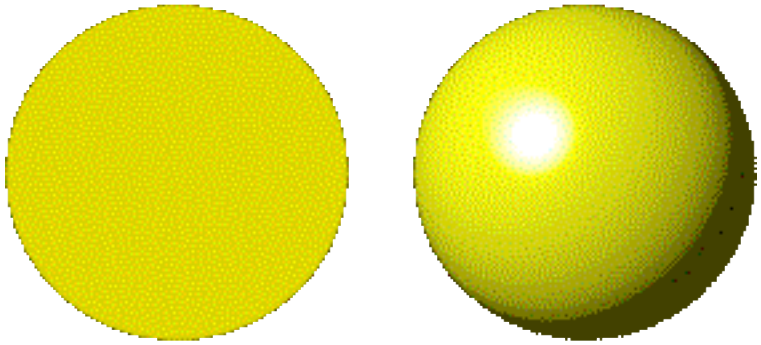
White, through Green and Blue (Tints and Shades)
In this colour band, the mint green was gradually replaced by more blue and black with each progressive colour. This is a somewhat dull but more natural looking.

White > Yellow > Orange > Red > Purple (Single Tint)
This colour band was made by picking a light pastel yellow to start, then varying the hue only towards orange, then red and finally a reddish purple. No variations in tint/shade were used.

Teal through Blue, Purple and Red (Single Shade)
This band is all of one shade, with variations only in colour - there is the same amount of black in each of the coloured boxes. Note how the teal still looks the lightest of all the colours, even though it has the same shade as the rest.

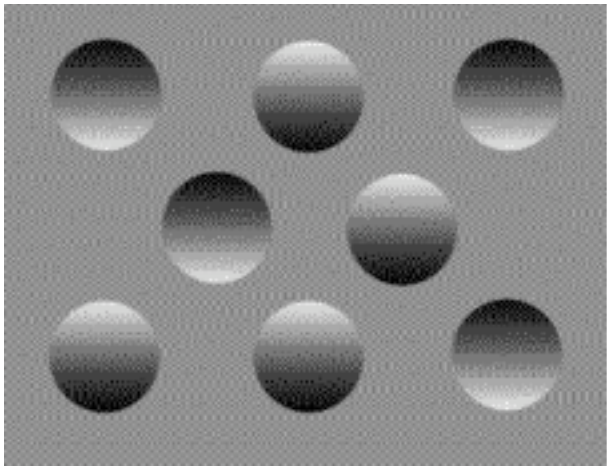
Light and Perspective

To successfully create more advanced shading, and more believable three dimensionality, an understanding of light and perspective is needed. Shading is essentially lying to the viewer's eye - by placing highlights and shadows, you can create the illusion that what you are looking at is not flat, but has shape.



Two identical spheres, one with shading and one without. The one on the left appears to be a flat circle, while the one on the right is easily identifiable as a "true" sphere, despite the fact that both are two dimensional sprites. The human brain interprets how light and shadow fall in order to assist our sense of depth perception and to make sense of the world around us. It is this innate ability spriters exploit in order to make their work realistic, as have artists for centuries before the invention of the computer.

Light/Shape Sensitive Shading (LSSS)



Take a look at this picture. Some of the circles look like they're dimpled inwards, while others appear to be bumps on the surface - raised. Unless something about the scene you are looking at says otherwise, your mind automatically assumes the light is coming from the top - where the sun would normally be.

Top lit or top lit from an angle sprites generally look right, regardless of what background you put them on.

So how do you apply this principle to a sprite? Read onwards. We're going to work with the original diamond.gif graphic again, and the same colours as before. However, this time we're going to shade it based only on light and shape, and not outlines.

Getting Started - starting is generally the hardest part. There are a couple of ways to do it, but the one I find the easiest is to dump in the basic colours based on how much light should be hitting each area of the sprite in general. For this diamond, I'm going to imagine a centred top down lighting source, so the two small diamonds nearest the top will be the lightest. I won't choose the very lightest colour in my band, since then I won't have anything to highlight with, so I'll fill with the next one down. (with a larger band you could use two or even three colours down from the lightest). The other three top triangles should be a bit darker, since they don't face up as much and would get less light. Finally for the bottom of the diamond, an even darker shade. Here's what that looks like.

Again, I'm going to go back to those two highest facets which are light grey right now. Much like I shaded the entire sprite, each section will now be graduated in a few tones, probably three for the small triangles. Since each facet of a diamond is flat, I'm not going to give it much shading. Most of the two top triangles is filled with white, leaving a small edge of the light grey around the bottom. The other three triangles that make up the top are shaded opposite - lighter around the top edges (which are closer to the light) and darker along the bottom. A good principle is to make sure that each shade of your colour only touches pixels that are one higher or lower on the band, and the outline. To try and make the edges look farther away, I darkened them a bit by using deeper shades.

The bottom three triangles which make up the point will be shaded the same way. First, the centre triangle. Since it's in line with the imaginary light source, it should be lightest at the top, and darkest at the bottom. Equal, or as close to equal as possible areas of each colour make for a smooth appearance. Note the single line of the lightest shade at the top, to simulate an edge.

The side sections are a bit more tricky. When highlighting multiple flat areas that intersect at an angle, try to line up the highlights because this makes them seem more natural.

Glossary

Colour Band - a group of colours arranged from lightest to darkest and used to add shading to a line art sprite. These are also sometimes called a colour set or colour palette.

Hue - having the attribute of colour - such as red, green, blue, etc., without specifying a particular brightness or tone. For example, pink, scarlet, crimson and burgundy can all be said to have a red hue.

Midtone - the one or two colours which lie in the centre of a colour band.

Shade - a pure colour plus a variable amount of black.

Tint - a pure colour plus a variable amount of white.

Exercises

Colour Exercises

Make a seven colour band for the following shades -

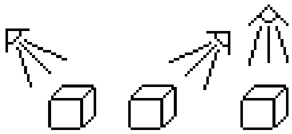
* Black to White
** Blue (tints only)
** Yellow (true yellow)
*** Yellow with orange shades

Shading Exercises

Take the cube sprite and try shading it with each of the techniques covered in this guide, starting with pillow embossing. You can also try varying your number of colours. What does it look like with three colours? Five? Seven? If you get tired of the cube, try the slightly more difficult pyramid, or even the sphere. You can also try making a larger version of these shapes and try shading those. How does the size of the sprite affect how many colours of shading looks good?

Light Exercises

Try shading each of these sprites with a range of colours of your choice from different lighting angles. The funny looking little triangle hats with three lines indicate your light source, and the direction of the lighting.



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