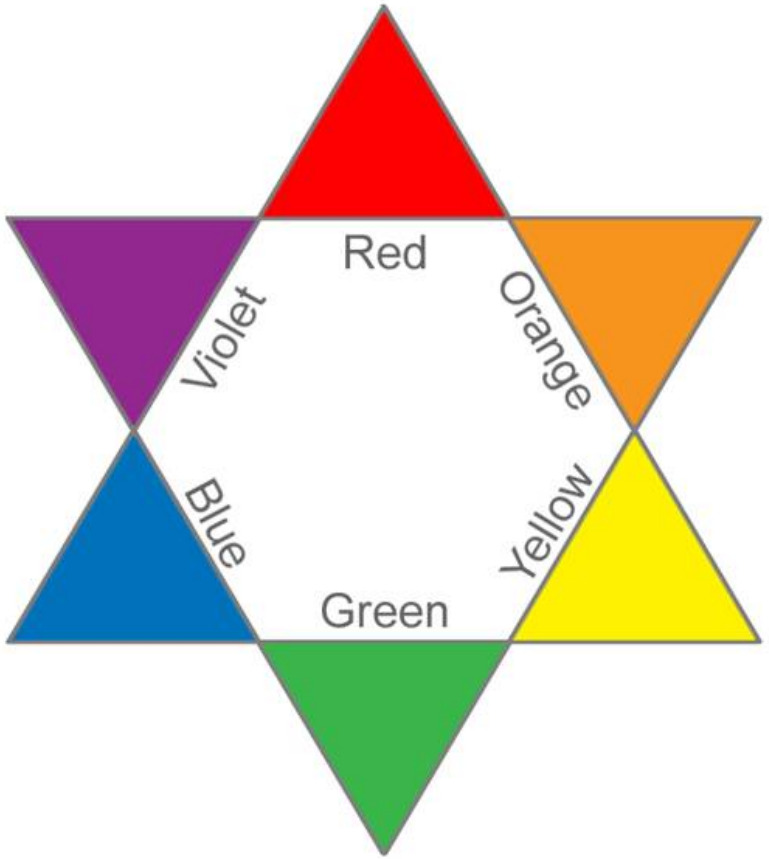
Basic Colour Theory and Blending

- The painter's colour wheel
- Mixing colours
- How colour is related to depth perception
- Blending to match the skin tone

Painter's Colour Theory

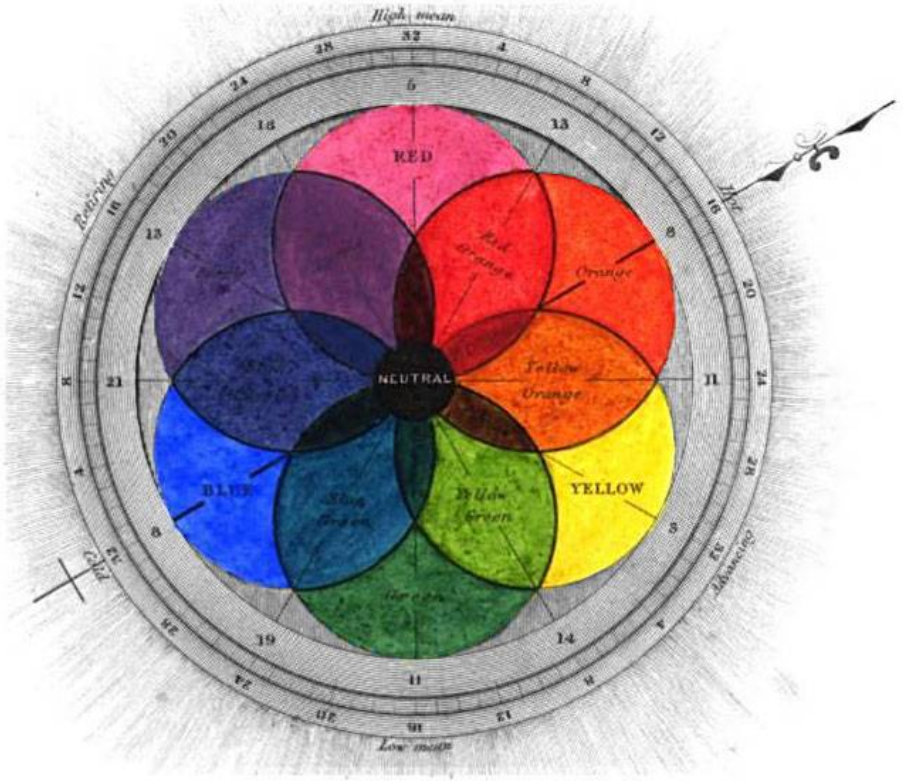
- A basic understanding of colour theory is necessary to choose and apply makeup correctly
- Colour theory helps you to mix colours and adjust colours for many different skin tones.
- Careful colour selection and application helps to sell the simulated wound

Painter's Colour Wheel



- At the left is a simplified painter's colour wheel.
- You can neutralize any colour by mixing or covering with the *complementary colour* (the opposite colour on the colour wheel)
- Green neutralizes red
- Violet neutralizes yellow
- Orange neutralizes blue

Using the Painter's Colour Wheel



- The painter's colour wheel shows the principle behind colour mixing
- A nearly infinite range of colours can be mixed from the three *primary colours*: red, yellow and blue
- A *hue* is a pure colour; one of the primary colours or a secondary colour formed by mixing two of the primary colours

Shades

- A *shade* is a hue mixed with black. A shade can also be produced by mixing in the hue opposite in the colour wheel.
- One common example of a shade is brown (orange mixed with black)

Tints

- A *tint* is a hue mixed with white.
- One common example of a tint is pink (red mixed with white)

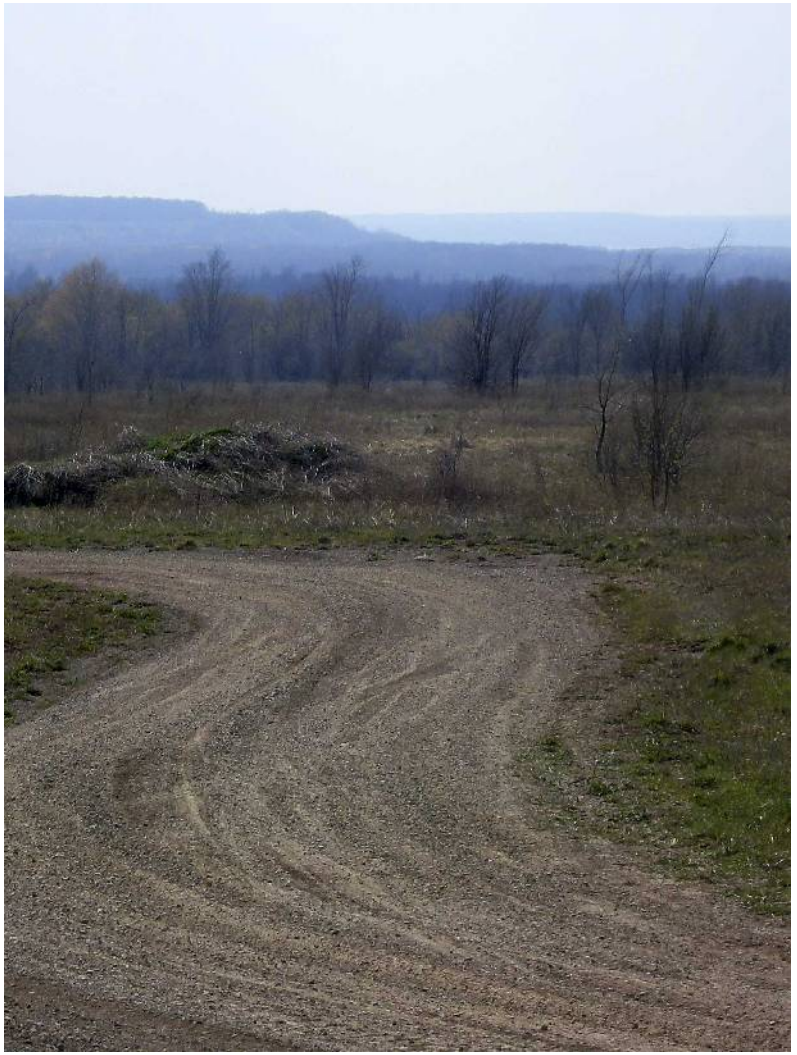
Colour and the surround

- Colour is not absolute. The perceived colour of an object depends upon the surrounding values.
- Both of the orange squares to the left are the same colour but appear to be different: an orange and a dark orange or brown.

Shadow Detail

- When colouring a wound, keep the shading gradual for more realism. Add the shading first (blue/purple) then layer translucent blood/flesh colours on top and blend
- Notice the detail in the shadow areas and the sparse use of absolute black on this painting by Jean-Baptiste-Siméon Chardin.

Colour in Nature



- Air molecules scatter shorter wavelengths of light (blue and violet) giving objects distant from us a cooler appearance
- Objects closer to us and lighted by direct sunlight appear warmer

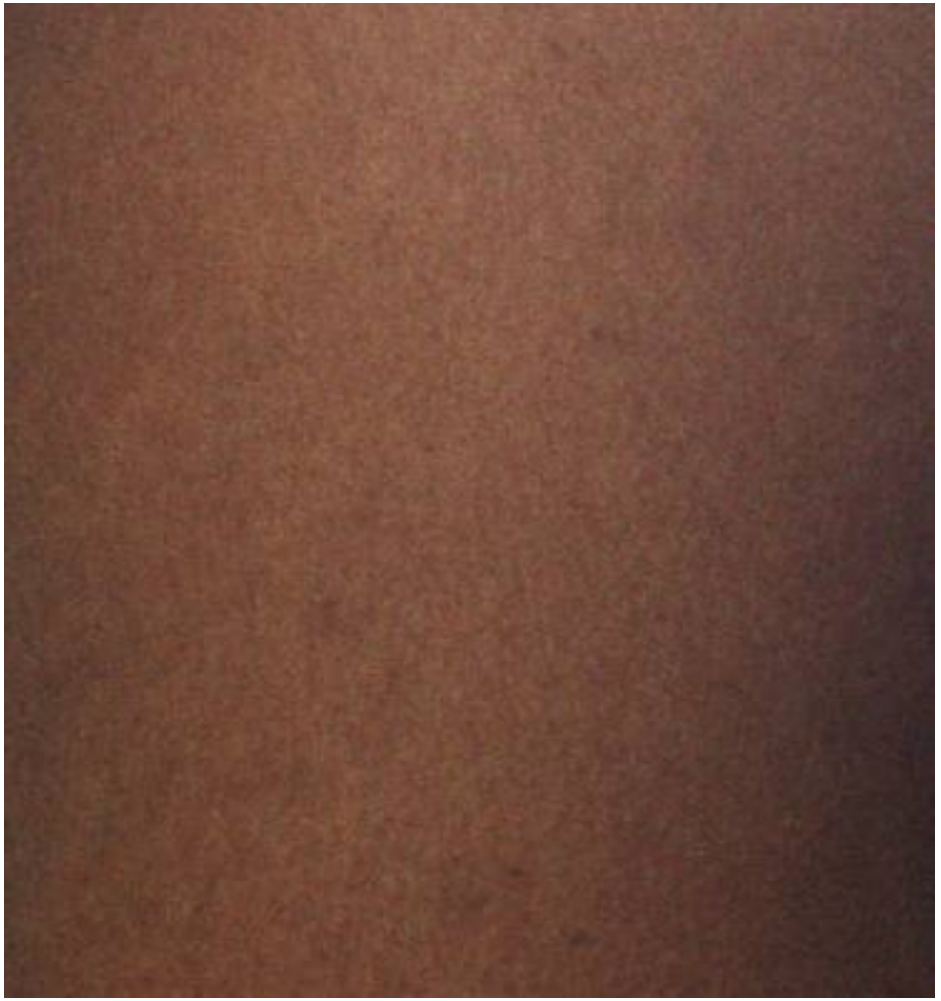
Shading and Depth Perception

- The deeper a hole in an object is, the darker the hole will appear.
- Shade the deeper parts of a wound darker to give the illusion of depth. Don't use black, instead use dark blue or dark purple.

Skin Tones - Light

- *Phenomelanin* is responsible for the red in human skin
- Women tend to have more phenomelanin than men
- Skin colour is influenced by subcutaneous fat

Skin Tones - Dark



- *Eumelanin* is a brown-black pigment in skin
- Varies among human populations
- Skin exposed to sunlight can darken and have uneven pigmentation

Skin and Age

- Genetics, exposure to sunlight and other factors (smoking) age the skin.
- The colour of skin becomes uneven with age. Spots appear and the skin wrinkles due to the loss of elasticity and the loss of subcutaneous fat.

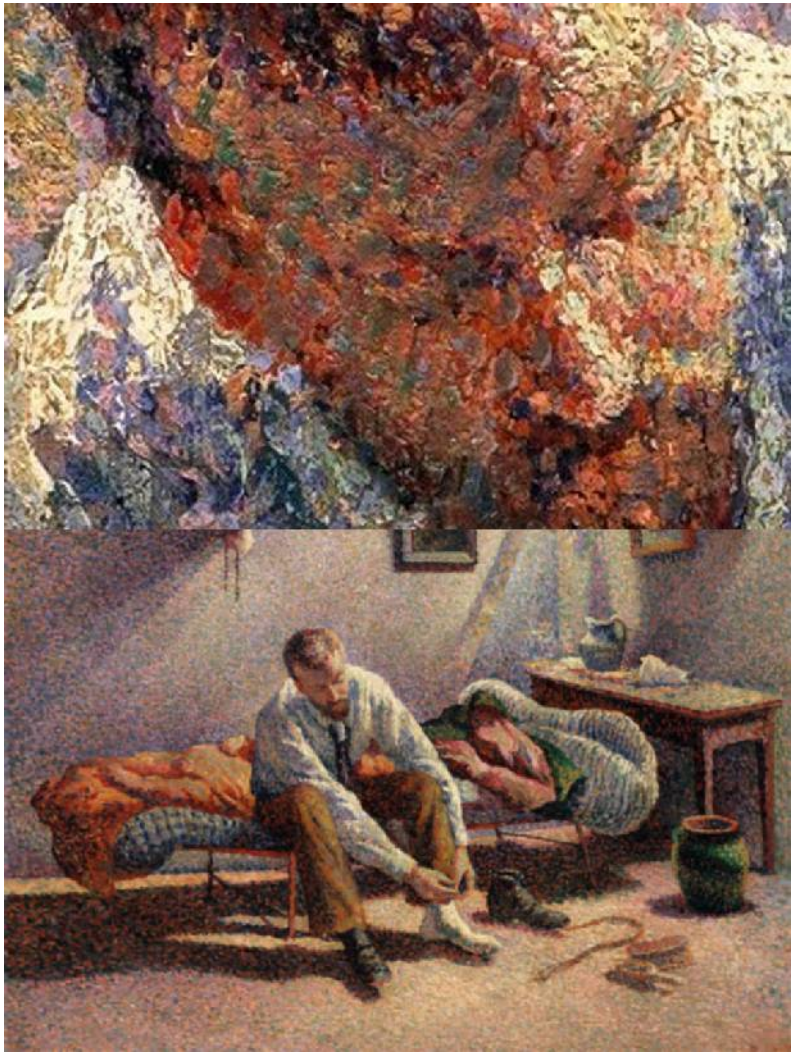
Stippling

- *Stippling* is a useful technique to blend to skin tones.
- Use a textured sponge. Load with colour and stamp the colour onto the surface.
- Vary the angle and rotate the sponge to give a random texture. The sponges should be torn into a non-uniform shapes.

Matching Skin Tones

- You'll use two colours, one slightly darker and one slightly lighter than the skin you're trying to match.
- Stipple the colours onto the area you're matching with a textured sponge. Don't blend the colours too much or the result will look artificial.

Matching Skin Tones



- *Morning Interior* (1890) by the French painter Maximilien Luce employs a similar blending technique. Compare the detail (upper image) with a larger portion of the painting. At a distance the eye blends the individual spots of colour into a smooth tone.

Patterns

- humans see patterns in nearly everything. It is difficult for us to create things which are random or asymmetric.
- wounds we design sometimes look fake since we find it difficult to introduce randomness into our design.

Randomness in Wounds

- wounds often exhibit randomness and asymmetry.
- consider the distance, direction, speed and size of the forces or objects causing the injury when designing the wound.
- use photo references of similar wounds where possible.

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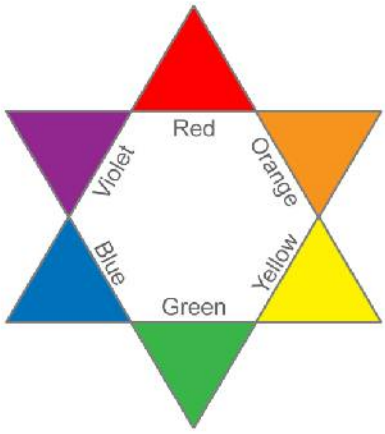
Painter's Colour Wheel



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A painter's colour wheel is used because we're working with pigments and it is easy to understand. In general skin tones are orange with a neutral component.

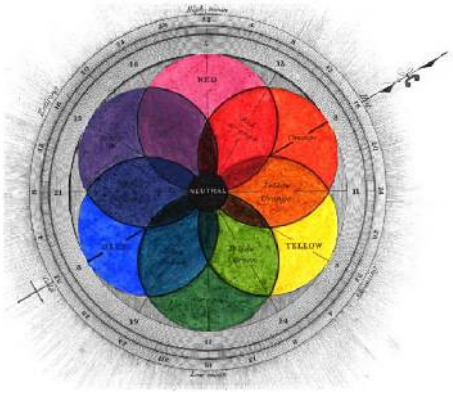
Red, blue and yellow are the primary colours. Other colours are mixtures of these.

A painter's colour wheel has several shortcomings. Red, yellow and blue are not equally spaced around the wheel. Using only these primaries it is impossible to mix some vibrant greens.

Colour names are only approximate. If you send ten people out to get “red” paint they will come back with ten different colours.

Colours do not really exist. What we describe as colours is the effect upon our visual system by the radiation from a small portion of the electromagnetic spectrum. Humans can see wavelengths of 390nm to 700nm. Other animals can see different portions of the electromagnetic spectrum.

Using the Painter's Colour Wheel



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RYB color chart from George Field's 1841 Chromatography; or, A treatise on colours and pigments: and of their powers in painting. Public domain fromWikipedia.

http://commons.wikimedia.org/wiki/File:Chromatography_1841_Field.png

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Colour and the surround

- Colour is not absolute. The perceived colour of an object depends upon the surrounding values.
- Both of the orange squares to the left are the same colour but appear to be different: an orange and a dark orange or brown.

Professional makeup artists usually dress in neutral colours, black or grey, so their clothing does not influence their colour sense. Environments with brightly coloured walls or furnishings, lighted with coloured lights or very darkly lighted can adversely affect your ability to select, mix and match colours.

For more about colour and illusion, see the Lotto Lab Studio at:
http://www.lottolab.org/articles/illusionsoflight.asp

The image is a view from Cathedral Bluffs in Scarborough looking east toward the Pickering Nuclear Generating Station.

Shadow Detail

- When colouring a wound, keep the shading gradual for more realism. Add the shading first (blue/purple) then layer translucent blood/flesh colours on top and blend
- Notice the detail in the shadow areas and the sparse use of absolute black on this painting by Jean-Baptiste-Siméon Chardin.

Still Life with Glass Flask and Fruit, circa1728, by Jean-Baptiste-Siméon Chardin

Colour in Nature

- Air molecules scatter shorter wavelengths of light (blue and violet) giving objects distant from us a cooler appearance
- Objects closer to us and lighted by direct sunlight appear warmer

Taken near Meaford, Ontario, afternoon early spring.

Shading and Depth Perception

- The deeper a hole in an object is, the darker the hole will appear.
- Shade the deeper parts of a wound darker to give the illusion of depth. Don't use black, instead use dark blue or dark purple.

A stab wound to the back causing an open pneumothorax.Vicente Scopel e Jorge Carlotto. Serviço de Cirurgia Geral e do Trauma do Hospital da Cidade - Passo Fundo - RS – Brasil. Posted by Jorge Carlotto, August 20, 2009.

From trauma.org

See Terms of Use at trauma.org

Note the highlight and shadow on the viscera protruding from the lower part of the wound. The small, specular highlights (small, well-defined and bright) give us the visual clue that the viscera is wet (shiny).

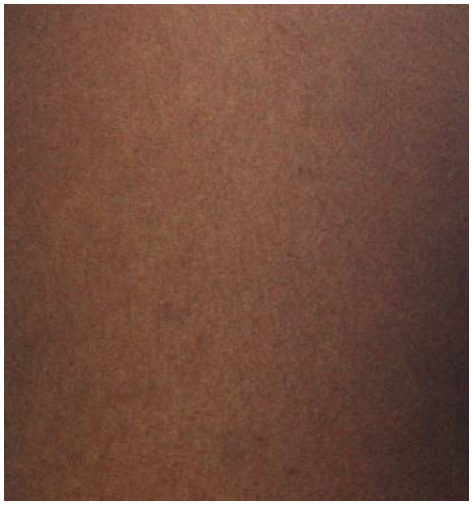
•Natural lighting comes from above (sunlight)
•Our visual system uses this to give us clues about the dimensionality of the object
•Shading can be used to quickly simulate a three dimensional wound
•Use a lighter shade on the edges of the wound which will pick up light. Subtle deformities can be simulated in this way

Skin Tones - Light

- *Phenomelanin* is responsible for the red in human skin
- Women tend to have more phenomelanin than men
- Skin colour is influenced by subcutaneous fat

Skin, mid 20s, Asian Canadian female. Flat area of the upper chest inferior to the clavicle.

Skin Tones - Dark



- *Eumelanin* is a brown-black pigment in skin
- Varies among human populations
- Skin exposed to sunlight can darken and have uneven pigmentation

Skin, mid 20s, African Canadian female. The area is the upper arm; the curvature of the area accounts for the fall off at the sides of the image.

Skin and Age

- Genetics, exposure to sunlight and other factors (smoking) age the skin.
- The colour of skin becomes uneven with age. Spots appear and the skin wrinkles due to the loss of elasticity and the loss of subcutaneous fat.

Skin, mid 90s, European Canadian male. Left cheek.

Stippling

- *Stippling* is a useful technique to blend to skin tones.
- Use a textured sponge. Load with colour and stamp the colour onto the surface.
- Vary the angle and rotate the sponge to give a random texture. The sponges should be torn into a non-uniform shapes.

Stippling is shading produced by applying the medium in small dots which blend together at a distance. Stippling can also refer to the method of application (stippling brush or stippler), which is generally an up-and-down movement with the brush or sponge to apply the paint.

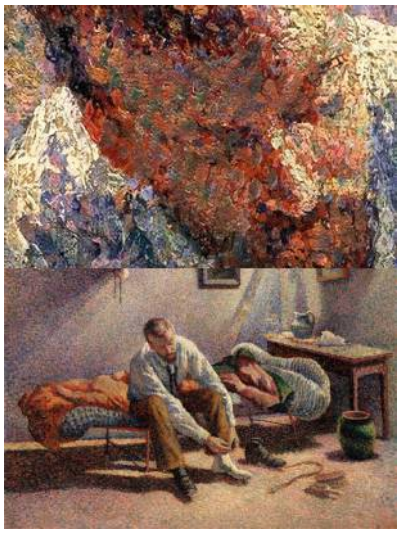
Matching Skin Tones

- You'll use two colours, one slightly darker and one slightly lighter than the skin you're trying to match.
- Stipple the colours onto the area you're matching with a textured sponge. Don't blend the colours too much or the result will look artificial.

This techniques relies on the ability of the eye to fuse spots of colour into a continuous tone at a distance; the same mechanism that the painting technique of Pointillism relies upon.

- Close-up the two tones will resemble the skin close up showing several tones
- At a distance, the two tones will merge giving the proper colour
- Most problems with replicating skin colour result from making the colour too even
- A store manikin looks fake because the skin colour is even.

Matching Skin Tones



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Maximilien Luce (13 March 1858 – 6 February 1941) French Neo-impressionist artist

Morning Interior (1890)

This is a faithful photographic reproduction of a two-dimensional, public domain work of art. Such reproductions are in the public domain in the United States. In other jurisdictions, re-use of this content may be restricted; see Reuse of PD-Art photographs for details. From:

http://en.wikipedia.org/wiki/File:Morning,_Interior_-_Luce.jpeg

Patterns

- humans see patterns in nearly everything. It is difficult for us to create things which are random or asymmetric.
- wounds we design sometimes look fake since we find it difficult to introduce randomness into our design.

The famous “Face on Mars” from the 1976 Viking 1 mission. The head in the image is about 3km long and is located in the Cydonia region of Mars. The black dots are data errors.

The ability to find patterns in large numbers of items is formalized in Ramsey theory. You can find out more about this topic at:
http://en.wikipedia.org/wiki/Ramsey_theory
http://www.math.ucsd.edu/~ronspubs/90_06_ramsey_theory.pdf
http://rationalwiki.org/wiki/Ramsey_theory

See this article as well *“What makes us see Jesus in a taco, or a human face on Mars?”*
http://io9.com/5953993/

Randomness in Wounds

- wounds often exhibit randomness and asymmetry.
- consider the distance, direction, speed and size of the forces or objects causing the injury when designing the wound.
- use photo references of similar wounds where possible.

From Simple English Wikipedia
http://simple.wikipedia.org/wiki/File:Shrapnel_wounds_from_IED.jpg

Note that most of the wounds are similar in size and shape.

The term fragment is preferable to “shrapnel” since shrapnel refers to a specific type of munition which has not been in common use since the first world war. For more about this see:
“Shrapnel:The Man,The Missile And The Myth” link below
http://www.ramcjournal.com/content/149/4/337.full.pdf+html