

Fuzzy Logic

A show geared towards all age groups where a red panda by the name of Tinker explores the world around himself using the scientific method and any and all tools at his disposal in his friend Kazee's garage.

Pilot Episode:

How the body heals its self

Required props:

- *Large Kitchen Knife*
- *Model of the different layers of the skin*
- *Model demonstrating how the Cardiovascular system clots*
- *bungee cords*
- *Stage blood*

Costume pieces

- *Tinker's Fursuit*
- *Lab coat*
- *Large protective goggles*
- *Maybe the Kazee suit... >.>*

Intro cues up. Splash screen of a cartoon version of Tinker mixing some chemicals in a couple of beakers and it exploding making a mess and spelling out the words "Fuzzy Logic". Screen wipe to Tinker using a kitchen knife and accidentally cutting himself.

Tinker: Ow! That hurt...

Tinker sucks on his finger for a second and shakes off the pain.

Hmm... better make sure that doesn't get infected...

Tinker wanders off into his bathroom. Camera cuts to him standing in front of his bathroom sink rummaging through his medicine cabinet and struggling to put a band-aid on his finger.

There we go! Good as new...

Tinker turns towards the camera and moves closer.

You know, one of the things that we take for granted every day is the way our bodies heal. But it's a pretty easy concept to wrap your brain around. You just need to shrink yourself down...

Tinker holds his mouth and taps one of his fingers on his nose for second.

Hmm... No that won't work... My ferret didn't like it that one time I tried fitting in her cage...

Tinker snaps his fingers.

Make things bigger.

Tinker runs off out his front door down the stairs and into his work shop. While the camera shows Tinker rummaging through piles of trash, paint and scrap; Tinker voices over a brief description of the structure of the different layers of skin.

Tinker Voice over: Your body's skin is made up into three main layers. The Epidermis, the Dermis and the Subcutis or Hypodermis. Each of these layers perform different functions in protecting us and allowing us to go about our lives as we spend every waking and sleeping hour being bombarded with bacteria and foreign objects.

Something falls on Tinker's head while he's cutting through a large piece of upholstery foam. Camera cuts to Tinker standing in front of a dry erase board where he scribbles out the different layers of the skin and colors them appropriately.

The first layer is the one everyone is familiar with: The Epidermis. The Epidermis is the part of our skin that forms a water tight seal around our body and is the first barrier that protects us from infection.(1) It's also where our pigmentation granules are. (3, Pg 906)

The second layer is the one where most of the work occurs: The Dermis. This is where our blood vessels supply the skin with nutrients and oxygen so each of the different cells can perform their jobs. Sweat glands that allow us to dissipate heat, sebaceous glands to keep the skin waterproof and supple; and nerve endings so we can feel and experience the world around us. Even hair follicles and the tiny muscles that make them stand on end when it's cold out. (3, Pg 906)

The third layer is the Subcutaneous layer. Depending on who you talk to and what text book you read, they might not even consider this as a layer of the skin. In this layer there is muscle tissue, the fascia surrounding the muscles and fat. This layer of the skin is responsible for insulating the body from the cold and padding our internal organs and bones from impact. (1)

The camera wipes to Tinker standing in his workshop very proudly displaying a large scale model of skin showing each of the layers of the skin. The model is constructed with different colored upholstery foam, clear vinyl hosing for the vessels and a few other odds and ends to show the different types of tissues and specialized cells in the body.

For those of you who are less of a two dimensional thinker and prefer to be able to reach out and grab things in the third dimension, I've made this model of the skin. Complete with a working cardio vascular system.

Tinker flips a switch on his work bench and energizes a condensate pump from an air

conditioning system. The camera pans along the vinyl hosing as the pump circulates stage blood through the hoses.

Like I mentioned before, The outer most layer is the epidermis. As our skin cells age and die they become Keratinized and work their way to the surface.

The camera cuts to a scientist with white hair, mustache and glasses standing in front of a dry erase board with the definition for Keratinization written out.

Claus: Keratinization (cornification): (v) The process in which the cytoplasm of the outermost cells of the mammalian epidermis is replaced by Keratin. Keratinization occurs in the Stratum Corneum, feathers, hair, claws, nails, hooves, and horns. (4)

The camera cuts to tinker standing in front of his model nodding in agreement with Claus.

Tinker: Thanks Claus.

Where the epidermis and the dermis meet are several ripples. This is called the Papillary Region. This is the structure that creates our fingerprints and help us grab onto, pick things up and where the capillary bed is. That's where all of the tiny little blood vessels are that supply cells with oxygen and nutrients through perfusion.

The camera again cuts to Clause standing in front of the dry erase board with the definition of perfusion written out.

Claus: Perfusion: (v) The process in which oxygen and nutrients are exchanged for carbon dioxide and waste in the capillary bed at a cellular level. (3. Pg. 487)

Again the camera cuts to tinker standing in front of his model of layers of skin.

Tinker: What he said.

Below the Papillary region we have the Reticular region. This layer is composed of dense irregular connective tissue and gets it's name from the concentration of collagenous, elastic and reticular fibers. (1) Its also where you can find arteries, veins, hair follicles, sweat glands and the Arrector Pili Muscles.

Camera cut to Claus standing in front of his white board again with the definition of Erector Pili Muscles.

Claus: Arrector Pili Muscles: (n) The small muscles attached to hair follicles in mammals. Contraction of these muscles causes the hairs to stand on end, known colloquially as goose bumps. (5)

Tinker voice over: Are you going to do that every time I say a five dollar word?

Claus nods slowly in response to Tinker's question. The camera cuts back to Tinker who heaves a sigh of frustration.

Tinker: The final layer is the subcutis. This is where our muscles and body fat are located. So,

now that we know the structure of the skin, lets start with the maiming!

Tinker turns around to gather some tools, pauses and then turns back towards the camera.

Oh, some of the demonstrations I do here can get a little hairy... So if you plan on recreating them, Make sure you do so in a safe manner and with adult supervision.

Tinker turns back around towards his tools, pulls out a large kitchen knife and stabs the model of the skin several times while Alfred Hitchcock's The shower theme is played briefly. The camera views another side of the skin and very carefully he fillets a portion of the model exposing the capillary bed in the Papillary region.

Now we all know what happens when you get cut. You bleed.

Again, Tinker flips a switch and turns on the pump allowing stage blood to pump out of the capillarity and out onto his work bench.

What you probably didn't know is that the first thing your body does is constricts small muscles around your vessels restricting the flow of blood.

Tinker flips twists a ball valve inline on the vinyl hosing to limit the flow of stage blood.

This does two things. One: it helps prevent you from bleeding to death and two: It gives the Platelets in our body time to stick to the opening of the wound. Before we go any further we should probably go over what's in our blood.

Camera cuts to Tinker standing in front of his dry erase board. The video is sped up as he draws up a beaker of blood with larger versions of the blood cells, platelets and leukocytes.

Tinker voice over: The first and more obvious part of our blood are the erythrocytes. Also known as red blood cells. These cells have a large surface area to volume ratio and that's so they can transport as much oxygen and carbon dioxide through out our body as possible. The next part of our blood are the leukocytes. Also known as white blood cells. These cells attack all foreign substances that get into our body. Thrombocytes, also known as platelets, are small cell fragments that when in the presence of clotting proteins, become sticky and restrict the flow of blood. All of these different types of cells are suspended in a fluid we called plasma. Plasma is made up of sugars, fats, vitamins, hormones and mineral salts and anything else the body needs to deliver to its organs and tissues.

Camera cuts to Tinker looking down at his model which is now making a very large mess of his work bench.

Tinker: While the blood flow is being restricted by the tiny muscles around our vessels. The body releases a hormone that causes the platelets to become sticky. They build up around the openings of the wound and restrict the flow of blood even further while the white blood cells attack anything that made its way into the body. Here I'll show you.

Camera cuts to another model that is dead hung from the rafters of Tinker's workshop. This model is a flat sheet of upholstery foam with a long jagged strip that can be removed from the center

of the sheet.

So lets say you get cut...

Tinker pulls the long jagged strip out of the upholstery foam letting red and white foam balls fall out of the "wound".

You start bleeding for a short time and if the wound isn't too traumatic, your body slows the blood flow. The platelets start sticking to the edges of the wound to even further restrict the flow of blood.

Tinker grabs a couple of flat pieces of foam board and sticks it to the back of the model around the edges of the "wound"

Then your body generates this stuff called fibrin that creates a mesh across the opening of the wound. This does two things. One it catches any of the extra blood that might try to get through the wound and it also helps bring the edges of the wound back together.

Tinker pulls a hand full of bungee cords out of his pocket and quickly stretches them across the back of the model partially closing the large "wound".

Then as the blood dries up it forms a scab.

Tinker pulls out another piece of upholstery foam that is colored a reddish brown color and slaps it on the front of the model

Over time your body will regenerate the layers of skin beneath the scab through a combination of cellular division and Keratinization.

Camera cuts back to Tinker in his house.

So there you have it. So next time you end up getting cut, keep in mind that your body has a lot of chemical processes and work to do in order to heal. Clean the wound with hydrogen peroxide or soap and water and make sure that you keep any bandages clean as well. The less infection your body has to fight off, the faster it will heal.

So now you know. And understanding it was half the fun. See you next time.

Tinker wanders off away from the camera and starts cleaning up the mess he's made in his workshop. As some of the credits start to roll.

Works Cited

1. **Human Skin** – Wikipedia
https://en.wikipedia.org/wiki/Human_skin
2. **How do wounds, cuts, scrapes, lacerations heal?** - Go Ask Alice
<http://goaskalice.columbia.edu/answered-questions/how-do-wounds-cuts-scrapes-lacerations-heal>
3. **Emergency Care and Transportation of the Sick and Injured Eleventh Edition**
American Academy of Orthopedic Surgeon
4. **Keratinization – Dicationary Definition**
<http://www.encyclopedia.com/science/dictionaries-thesauruses-pictures-and-press-releases/keratinization>
5. **Arrector Pili Muscle** – Wikipedia
https://en.wikipedia.org/wiki/Arrector_pili_muscle