

Skin Under the Microscope

mrsajdak.com/skin-layers

Name _____

Date _____

Period _____

DAY 1 Skin has two layers, the **epidermis** on top and the **dermis** below, with the **subcutaneous layer** beneath them. Find each layer on a slide, measure it, test injuries, and compare six places on the body.

Part 1. Virtual microscope (Tab 1)

SEP 3, 4, 5 • CCC Scale, Proportion, and Quantity

Turn the focus until the slide is sharp. Click a spot inside the circle and name the layer. Find all three on both slides.

1. Tick the layer each clue describes.

What you see on the slide	Epidermis	Dermis	Subcutaneous layer
Stacked cells with purple nuclei, no blood vessels	☐	☐	☐
Pink fibers, blood vessels, glands, hair roots	☐	☐	☐
Big round fat cells that look empty	☐	☐	☐

2. The eyepiece scale has 50 divisions. One division is worth: at 4× _____ μm, at 10× _____ μm, at 40× _____ μm.

3. Measure each layer straight down the scale. Use **Check** to make sure. (1,000 μm = 1 mm)

Slide and layer	Objective you used	Divisions	× μm per division	= μm	= mm
Thin skin (forearm): epidermis					
Thin skin (forearm): dermis					
Thick skin (palm): epidermis					
Thick skin (palm): dermis					

4. Which objective worked best for the thin epidermis, and why not 4×?

5. Try each injury on **both** slides. Write the deepest layer it reaches and circle whether it bleeds.

Injury	Thin skin (forearm): deepest layer	Bleeds?	Thick skin (palm): deepest layer	Bleeds?
Scrape, 0.05 mm		yes · no		yes · no
Cut, 0.3 mm		yes · no		yes · no
Deep cut, 2.0 mm		yes · no		yes · no

6. The same 0.3 mm cut bleeds on the forearm but not on the palm. Explain, using what the epidermis has and does not have.

Part 2. Body map (Tab 2)

SEP 4, 5 • CCC Patterns • Structure and Function

7. Click all six sites. Fill in the table.

Site	Eyelid	Forearm	Upper back	Palm	Fingertip	Sole (heel)
Epidermis (mm)						
Dermis (mm)						
Thick or thin skin?						

8. Sole epidermis _____ ÷ eyelid epidermis _____ = _____ times thicker. Does your forearm measurement from question 3 match the chart? _____

9. Line the slices up by epidermis. The three thickest share something. What do those places do all day?

10. The upper back has the **thickest dermis** but a **thin epidermis**. Use what each layer is built for to explain why.

DAY 2 Each layer has layers of its own. The epidermis is built from **strata**; the dermis has a **papillary** and a **reticular** layer.

Part 3. Inside the epidermis (Tab 3)

SEP 2, 4 • CCC Stability and Change

On **Thick skin**, click each band and name it. Then switch to **Thin skin**.

11. Write the five strata in order, **bottom to top**. Tick the one that is in thick skin only.

Order	Stratum	Thick skin only	What happens to cells here
1 bottom		☐	
2		☐	
3		☐	
4		☐	
5 top		☐	

12. On **Thin skin**, follow one cell. It enters the spinosum on day _____, the granulosum on day _____, the corneum on day _____, and flakes off on day _____. That is about _____ weeks.

13. The cell dies in the stratum _____. By then it is filled with _____.

14. Turn on **Show where food and oxygen come from**. The epidermis has no blood vessels. Where do its cells get food and oxygen, and why does it matter that the top cells are dead?

15. Cells flake off the top every day, yet the epidermis stays the same thickness. What keeps it steady?

Part 4. Inside the dermis (Tab 4)

SEP 3, 4 • CCC Structure and Function

16. Find all seven. Then tick where each one is.

Structure	Papillary layer	Reticular layer
Capillary loop	☐	☐
Touch receptor (tactile corpuscle)	☐	☐
Thick collagen bundles running every direction	☐	☐
Coiled sweat gland	☐	☐

17. Pull test: press **Skip to the end** for each row.

Sample and direction	Papillary • along	Reticular • along	Reticular • across	Tendon • along	Tendon • across
Force to tear (N)					

18. The reticular layer is _____ times stronger than the papillary layer. It is about as strong across as along, but a tendon is not. Explain using how the fibers are arranged.

19. Switch to **Fingertip surface**. Ridges crossing the 5 mm line: _____. So the ridges are _____ mm apart. Your fingerprints are the same all your life, even though the epidermis is replaced every few weeks. Why?

Wrap it up

SEP 6, 7 • CCC Stability and Change

20. **Claim:** tattoo ink lasts for life only because it is put into the dermis. Give **evidence** from two different tabs and your **reasoning**.