

Hair, Nails and Glands Lab

mrsajdak.com/skin-appendages

Name _____

Date _____

Period _____

DAY 1 Hair and nails are made the same way: living cells divide, fill with **keratin**, die, and are pushed out.

Part 1. Build a hair (Tab 1)

SEP 2 Models • SEP 5 Math • CCC Structure and Function • Stability and Change

1. Name each pin in the lab. Then write the letter of each part's job. Two parts share a job.

JOBS A. is the hair (dead cells) • B. makes the hair • C. feeds the bulb • D. the tube it grows in • E. oils hair and skin • F. stands it up

Part	Job
Hair shaft	
Hair root	
Hair follicle	
Hair bulb	

Part	Job
Hair papilla	
Sebaceous gland	
Arrector pili muscle	

2. Watch each hair through a whole growing phase. Use the graph and the **Right now** card.

Hair	cm per month	Growing phase (months)	Longest (cm)	Check: rate × months
Scalp hair				
Eyebrow hair				

3. At month 36.5 the scalp hair is in the _____ phase. The resting phase lasts _____ months.

4. Set the scalp hair to month 10 and press **Cut it to 1 cm**. At month 12 it is _____ cm long. Did cutting change how fast it grows? Use where hair is made to explain.

5. Explain why an eyebrow never grows as long as scalp hair. Use your numbers from question 2.

6. Tick **Cold or a scare**. What contracts? _____ What does the hair do? _____

Part 2. Grow a nail (Tab 2)

SEP 4 Data • SEP 5 Math • CCC Scale, Proportion, and Quantity

7. Name all six pins. Then tick what each part is.

Part	Nail plate	Free edge	Lunula	Cuticle	Nail bed	Nail matrix
Living cells that make the plate	☐	☐	☐	☐	☐	☐
Dead, keratin-filled plate	☐	☐	☐	☐	☐	☐
Skin around or under the plate	☐	☐	☐	☐	☐	☐

8. Grow out the blue line. Record the distance from the cuticle.

Nail	Month	mm	Month	mm	mm per month	Months to the free edge
Fingernail	2		4			
Big toenail	5		10			

9. **Case: grooves after a fever**. Click each groove. Fingernail: _____ mm ÷ _____ mm a month = _____ months.

Toenail: _____ mm ÷ _____ = _____ months. Same event? _____

Part 3. Hair evidence (Tab 3)

SEP 3 Investigating • SEP 7 Argument • CCC Structure and Function

10. Measure each sample with the blue lines. Medullary index = medulla ÷ hair width.

Sample	Hair width (µm)	Medulla width (µm)	Medullary index	Human, animal, or not a hair?
Hair from the scene				
Person A				
Person B				
The dog				
Car-seat fiber				

11. The scene hair's root is _____ (club or pulled), so it fell out in the _____ phase.

12. Your verdict: the scene hair is consistent with _____. Why can a microscope not prove whose hair it is?

DAY 2 Three kinds of gland sit in the dermis. Two make sweat and one makes oil. Find each one, then test which sweat glands switch on, and when.

Part 4. Three glands (Tab 4) SEP 2 Models • CCC Structure and Function • Stability and Change

Start with the **Armpit** at age 16. Click each gland and name it.

13. Fill in the table.

Gland	What it looks like	Opens onto the skin surface	Opens into a hair follicle	What it makes
Eccrine sweat gland		☐	☐	
Apocrine sweat gland		☐	☐	
Sebaceous gland		☐	☐	

14. Armpit, age 16. Try each setting. Tick every gland that releases something.

What is happening	Eccrine	Apocrine	Sebaceous
Cool and calm	☐	☐	☐
Exercise in a warm room	☐	☐	☐
Stress: giving a speech	☐	☐	☐

15. Switch to age 10 with **Stress**. Which two glands change between age 10 and age 16, and how?

16. Switch to the **Palm**. Which glands are missing? Explain using where those glands empty.

Part 5. Sweat-print test (Tab 5) SEP 3 Investigating • SEP 4 Data • SEP 5 Math • CCC Patterns • Cause and Effect

17. **Plan.** Question: *is palm sweat for cooling or for grip?* Which runs answer it? List them, and name two things kept the same in every run.

18. Run the test. Count the dots in the window. Per cm² = dots × 20.

Site	Exercise, warm room: dots	per cm ²	Mental-math test: dots	per cm ²
Palm				
Upper back				

19. Switch to **Which site has the most sweat glands?** and use pilocarpine (every gland on).

Every gland on	Palm	Sole	Forehead	Forearm	Upper back	Thigh
Dots in the window						
Glands per cm ²						

Wrap it up SEP 6 Explanations • SEP 7 Argument • CCC Cause and Effect

20. **Claim:** palm sweat glands are mostly for grip, and back sweat glands are for cooling. Give **evidence** from question 18 and your **reasoning**. Then say what the apocrine glands respond to.