Aging Skin Lab

Name _____

Date _____

Period _____

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DAY 1 of 2 Same skin parts, sixty years apart. Today: what time does to the **dermis** and the **epidermis**, and how to measure it.

☐ I can describe how the collagen, elastic fibers, epidermis, fat and blood vessels of the skin change with age.

☐ I can use snap-back data to show that older skin springs back more slowly, and explain why.

Part 1. The pinch test (Tab 1)

SEP 3 Investigating · SEP 4 Data · SEP 5 Math · CCC Patterns

Pick **Age 16** and **Flat on the desk**. Press **Pinch**. When the skin is flat, the trial is saved. Do 3 trials. Copy from **Your pinch tests**.

1. Age 16. Then switch to **Bent in a fist** and do 3 more trials. **Average:** add the three trials, then divide by 3.

Age 16	Trial 1 (s)	Trial 2 (s)	Trial 3 (s)	Average (s)
Hand flat				
Hand bent in a fist				

2. Your three flat trials were ☐ all the same ☐ not all the same. The biggest minus the smallest is _____ s. Bending the hand changed the average from _____ s to _____ s.

3. Hand flat. Do 3 trials at every age. Copy each average and the range on that age's data card.

Age	16	25	37	52	65	80
Average (s)						
Data card range (s)	class average					

4. What is the pattern as age goes up? The age-65 average ÷ the age-16 average = _____, so about _____ times as long. The biggest jump is between ages _____ and _____.

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 5.

5. A classmate pinched with her hand in a fist and got 2.4 s. She says her skin is aging early. Reply to her. Use the words **controlled variable** and **average**, and say what the pinch test measures.

Part 2. A model of the dermis (Tab 2)

SEP 2 Models · SEP 3 Investigating · CCC Structure and Function

For each piece: **1. Lay it flat**, **2. Stretch to 15 cm** (the string: **Pull it firmly**), **3. Wait 1 minute**. Copy from **Your measurements**.

6. Measure all three pieces on the model mat.

Piece	Before (cm)	5 s after (cm)	1 min after (cm)	Snap back? (yes / slowly / hardly stretched)	Pull (N)
New hair tie					
Worn hair tie					
Cotton string					

7. Which piece came back the way the age-16 fold did (fast)? _____ Which came back the way the age-80 fold did (slowly)? _____ Which took the biggest pull but hardly stretched? _____

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 8 to 10.

8. Label the mat in the lab. Lane 1 models _____ Lane 2 models _____ Lane 3 models _____ The two cards that fit no lane: _____ and _____. Why do they not fit?

9. Model check (SEP 2). One way the worn hair tie is like old elastic fibers: _____ _____ One way the hair tie model is **not** like real skin:

10. "Wrinkles come from skin drying out, so lotion will fix them." Fix it. Start: *Wrinkles come mostly from …*

Part 3. Inside the skin at 20 and 80 (Tab 3)

SEP 4 Data · CCC Stability and Change · Structure and Function

Count: pick each thing in the list. **Cell clock:** run the forearm, then the upper inner arm. **Bump test:** bump both arms. Copy from **Inside the skin**.

11. Count each thing in the two drawings of the forearm. Change = age 80 minus age 20.

Thing in the drawing	Age 20	Age 80	Change
Rows of living cells in the epidermis			
Elastic fibers, whole			
Elastic fibers, broken			
Collagen bundles			
Blood vessels in the dermis			
Fat cells under the dermis			

12. Cell clock: days for a new cell to reach the top of the epidermis. Difference = over 60 minus under 35.

Body site	Under 35 (days)	Over 60 (days)	Difference (days)
Forearm			
Upper inner arm			

13. Bump test: the same small bump. Bruise at age 20? _____ At age 80? _____ In the drawing, what broke?

_____

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 14.

14. Fill in the empty boxes. Use your numbers from 11 to 13.

Part of the skin	What changes with age	What you can see or feel
Collagen and elastic fibers (dermis)		A slow snap-back. Wrinkles.
Epidermis and stratum basale	Thinner. Cells divide more slowly.	
Fat in the subcutaneous layer		
Blood vessels in the dermis		Bruises more easily. Hands feel colder.

Part 4. A patient, age 84 (Tab 4)

SEP 3 Investigating · SEP 6 Explanations · CCC Cause and Effect

She scraped her forearm on a bed rail, and the bandage is taped on. Pick the arm, the tape and the peel. Press **Peel the tape**. Copy from **Tape tests**.

15. Test all four choices on her arm, then one on her grandson's.

Arm	Tape	Peel	Pull	Hold	Skin tear or safe?
Patient, 84	Regular	Fast, up			
Patient, 84	Regular	Slow, low			
Patient, 84	Soft silicone	Fast, up			
Patient, 84	Soft silicone	Slow, low			
Grandson, 16	Regular	Fast, up			

16. The skin tore every time the pull was ☐ bigger than ☐ smaller than the hold. The same regular tape, peeled fast, was safe on the grandson because his hold is _____ and hers is _____.

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 17 and 18.

17. Why will her scrape close more slowly than her grandson's? Use **stratum basale** and one number from Question 12.

18. Explain it (SEP 6). Why does the nurse use soft silicone tape and peel it slowly, low and flat? Build the explanation in three parts.

Part	Your explanation
What happened (two numbers from Question 15)	
The science idea (what is happening in her skin)	
How the data shows the idea	

NYSSLS: building toward HS-LS1-1 and HS-LS1-3. Hole's Essentials 6.2 (layers of the skin), 6.4 (skin function, wound healing) and 20.4 (aging) (AP.3.6.9). Cell clock days: Grove and Kligman (forearm and upper inner arm, adults under 35 and over 60). Snap-back times sit inside the class data card ranges, which come from a widely reprinted pinch chart, not a published study. The counts in Part 3 and the pull and hold in Part 4 are from a model made to show the pattern; they are not measurements. SEP = Science and Engineering Practice, CCC = Crosscutting Concept.