Burns and Wounds Lab low-write

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Name _____
Date _____
Period _____

BURNS A **burn** is skin killed by heat. Two things decide how bad it is: how **deep** it goes and how **much** skin it covers.

☐ I can use data to explain how the temperature and the time of contact decide how deep a burn goes.

☐ I can tell a first-, second- and third-degree burn apart from its signs, and measure a burn with the rule of nines.

Part 1. Heat and time (Tab 1)

SEP 3 Investigating · SEP 4 Data · SEP 5 Math · CCC Cause and Effect

Set **Time on the skin** to **10 min**, **Adult**, first aid **Nothing**. Change only the water. Press **Run**. Copy from **Your runs**.

1. How long until the water burns? Write the time, or write **never**.

Water	104°F	120°F	130°F	140°F	180°F	212°F
2nd degree after						
3rd degree after						

2. (Like 2.0 min × 60 = 120 s, and 120 s ÷ 4 s = 30 times.) Heater turned down from 140°F to 120°F. The 120°F time is _____ min × 60 = _____ s. Then _____ s ÷ _____ s = _____ times as long.

3. The water that never burned: ☐ 104°F ☐ 120°F ☐ 130°F. Dashed red line: cells start to die above _____°F.

4. 140°F. 3rd degree after: adult _____, small child _____. Ruler: the dermis ends at _____ mm (adult) and _____ mm (child).

5. A fair test of first aid. Boiling water, 10 s, adult. Change only the first aid.

First aid	Dead after 2 min (mm)	Dead 2 days later (mm)	2nd degree	3rd degree
Nothing			☐	☐
Cool running water			☐	☐
Ice			☐	☐
Butter			☐	☐

READ FIRST. In the lab, find the **Learn It** box under the drawing and read it. Then answer 6.

6. The child's skin burns through sooner because it is ☐ thinner ☐ thicker ☐ hotter, so the heat has ☐ less ☐ more skin to cross.

Best first aid: ☐ nothing ☐ cool running water ☐ ice ☐ butter. It left _____ mm dead. Nothing left _____ mm.

Butter is the worst because it ☐ holds the heat in ☐ cools too fast ☐ is too cold

Part 2. Read the burn (Tab 2)

SEP 4 Data · SEP 6 Explanations · CCC Patterns · Structure and Function

7. Use all four tools on each burn. Then classify it. (Case 6: test the **middle**.) Circle the degree.

Case	Blisters: yes	Blisters: no	Color returns in	Pain (0 to 10)	Degree
1. Beach day	☐	☐			1st 2nd 3rd
2. Pasta water	☐	☐			1st 2nd 3rd
3. House fire	☐	☐			1st 2nd 3rd
4. Hot pan handle	☐	☐			1st 2nd 3rd
5. Curling iron	☐	☐			1st 2nd 3rd
6. Exhaust pipe	☐	☐			1st 2nd 3rd

8. **WORDS** dermis · epidermis · muscle · hypodermis A first-degree burn hurts only the _____. A second-degree burn reaches into the _____. A third-degree burn goes all the way through the _____.

9. The deepest burns hurt the least. That is because the ☐ blisters ☐ nerve endings ☐ hairs in the dermis are ☐ dead ☐ bare

Part 3. Rule of nines (Tab 3)

SEP 2 Models · SEP 5 Math · CCC Scale, Proportion and Quantity

10. Adult, front + back (like 4.5 + 4.5 = 9). Head and neck _____% · each arm _____% · each leg _____% · the trunk _____%

11. Paint each patient. Press **Check my painting**. Copy from **Your patients**. Tick how serious.

Patient	Burn that counts (%)	Fluid, first 24 h (mL)	Minor	Moderate	Critical
1. Fryer oil			☐	☐	☐
2. Campfire			☐	☐	☐
3. Sunburn			☐	☐	☐
4. Soup pot (child)			☐	☐	☐

12. Patient 1: 4 mL × _____ kg × _____% = _____ mL. **Small child.** Head and neck: adult _____%, child _____%. Each leg: adult _____%, child _____%.

READ FIRST. In the lab, find the **Learn It** box under the drawing and read it. Then answer 13.

13. Patient 3 counts 0% because a first-degree burn hurts only the ☐ epidermis ☐ dermis, so it does not leak.

A child's head is a ☐ bigger ☐ smaller share, because from baby to adult the ☐ legs ☐ head grow more.

WOUNDS A **wound** is a break in the skin, or under it. Healing happens in four stages, and the cells do the work.

☐ I can name six kinds of wounds from how they were made and how they look.

☐ I can put the four stages of healing in order and tell what the cells do in each one.

Part 4. Six wounds (Tab 4)

SEP 2 Models · SEP 4 Data · CCC Cause and Effect · Structure and Function

14. Make a wound. Make all six. Write the letter of the wound and of the deepest layer. Circle the risk.

WOUND A. abrasion · B. incision · C. laceration · D. puncture · E. avulsion · F. contusion

LAYER W. epidermis · X. dermis · Y. hypodermis · Z. muscle

How it happened	Wound (A to F)	Deepest layer (W to Z)	Infection risk
Slid on pavement			none low medium high
Sliced by broken glass			none low medium high
Fell on a jagged rock			none low medium high
Stepped on a nail			none low medium high
Caught in a machine			none low medium high
Hit by a baseball			none low medium high

READ FIRST. In the lab, find the **Learn It** box under the drawing and read it. Then answer 15 and 16.

15. The puncture bled ☐ the least ☐ the most. Its infection risk is high because the hole is ☐ wide and shallow ☐ narrow and deep, so germs are ☐ washed out ☐ trapped inside

16. Mystery wounds. Write a letter, A to F. 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

17. Bruise clock. Record each day. Write the color and the letter of the pigment. A green bruise is about ☐ 1 ☐ 6 ☐ 12 days old. **PIGMENT** P. hemoglobin with oxygen · Q. hemoglobin without oxygen · R. biliverdin · S. bilirubin · T. hemosiderin

Day	0	3	6	8	12
Color					
Pigment (P to T)					

Part 5. Heal it (Tab 5)

SEP 3 Investigating · SEP 4 Data · CCC Stability and Change · Cause and Effect

18. Run a **Deep cut**, **Stitches**, **Clean and covered**. Write the letter of the job and of the workers.

JOB A. rebuild · B. stop the bleeding · C. strengthen · D. clean up

WORKERS W. fibroblasts · X. platelets · Y. neutrophils and macrophages · Z. collagen, packed tighter

Stage	1. Hemostasis	2. Inflammation	3. Proliferation	4. Remodeling
Job (A to D)				
Workers (W to Z)				

19. A fair test of care. Deep cut, **Left open**. Change only the care.

Care	Skin closed (day)	Inflammation over (day)	Scar (mm)	Strength on day 21
Clean and covered				
Left to dry				
Dirty				

20. A friend says, "Let a cut air out so it scabs over. It heals faster." The friend is ☐ right ☐ wrong. Covered, the skin closed on day _____. Left to dry, it closed on day _____.

21. Deep cut, stitches, clean and covered. Strength on day 7 _____ · day 21 _____ · day 90 _____ · 1 year _____
When the stitches come out, near day 7, the cut is ☐ still weak ☐ fully healed. A scar gets back to 100%: ☐ yes ☐ never

22. Clean and covered. Compare a scrape with a third-degree burn.

Wound	Skin closed (day)	Scar (mm, or none)
Scrape		
Third-degree burn, left open		
Third-degree burn, skin graft		

Wrap it up

SEP 6 Explanations · SEP 7 Argument · CCC Structure and Function

READ FIRST. In the lab, find the **Learn It** box under the drawing and read it. Then answer 23.

23. Claim: how deep a burn or a wound goes decides how it heals.
Evidence: the scrape closed on day _____ with no scar. The third-degree burn, left open, took until day _____.
Reasoning: under a scrape the _____ is still alive, and new skin grows out of its hair follicles. (Words: dermis, muscle, scab)

NYSSLS: building toward HS-LS1-2, HS-LS1-3 and HS-LS1-4. Hole's Essentials 6.4 (skin functions, wound healing) and its feature on burns (AP.3.6.7). Burn times follow the scald measurements of Moritz and Henriques (1947). The days, cell counts and scar widths in Part 5 are from a model made to show the pattern; they are not medical values. SEP = Science and Engineering Practice, CCC = Crosscutting Concept.