Skin Clues

Trace how different exposures lead to skin conditions

HAP.3.3 "Research and analyze the causes and effects of various pathological conditions (e.g., burns, skin cancer, bacterial/viral infections, and chemical dermatitis)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each cause or exposure and circle its effects on the skin. Give each linked cause and its effects the same number so you can trace how each condition develops.

What Happened at the Pool?

1. At a community pool, a lifeguard spends several hours in direct sunlight without shade. By evening, her shoulders are red and painful: ultraviolet (UV) radiation has damaged skin cells and triggered inflammation, a sunburn. A sunburn is not the same as a heat burn. If a cook touches a hot pan, heat injures the skin; deeper burns can destroy the epidermis and part of the dermis, damaging nerve endings and increasing fluid loss. Repeated UV exposure can also damage DNA in skin cells. If mutations affect genes controlling cell division, cells may grow out of control and form skin cancer.

2. Near the pool, a maintenance worker repeatedly wipes handrails with a diluted cleaner without gloves. His wrist begins to sting, and a red patch develops where the liquid touched his skin. The cleaner can directly irritate the outer skin and cause irritant contact dermatitis, an inflammatory reaction that does not require germs. Meanwhile, a swimmer scrapes a knee on rough concrete. The break in the skin barrier gives bacteria a path into tissue. If bacteria multiply there, the area may become warm, swollen, and tender, and pus may collect. Both conditions can cause redness, but their immediate causes differ.

3. A second swimmer has a small, rough bump on a finger that has slowly grown over several weeks. Some types of human papillomavirus (HPV) can enter through tiny breaks in the skin and cause common warts by making infected skin cells grow more rapidly. A virus reproduces inside host cells, while bacteria are cells that can multiply on their own. Antibiotics used for some bacterial infections do not treat viral warts. To investigate any skin problem, a clinician asks what touched the skin, when symptoms began, and whether the area is spreading. Similar-looking redness alone cannot reveal the cause.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the causes and possible skin effects of a sunburn and a deep heat burn differ?

2. Trace how repeated UV exposure can lead to skin cancer.

3. The worker's wrist and the swimmer's knee may both look red. How do their causes differ, and what other effects might help distinguish them?

4. How does HPV cause a wart, and why would antibiotics used for some bacterial infections not treat it?

3 YOUR TURN

Your own words

A student has a red, tender patch after cleaning a shared sports mat and notices a small cut nearby. Compare two possible causes from the passage, predict one additional effect of each, and give two questions that could help distinguish them without assuming redness proves either cause.

ANSWER KEY

Skin Clues

PART 1 · READ AND MARK

Underline each cause or exposure and circle its effects on the skin. Give each linked cause and its effects the same number so you can trace how each condition develops. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the causes and possible skin effects of a sunburn and a deep heat burn differ?	**UV radiation damages skin cells and triggers the redness and pain of sunburn. Heat causes a heat burn; a deep one can damage the epidermis, dermis, and nerve endings and increase fluid loss.**
2	Trace how repeated UV exposure can lead to skin cancer.	**Repeated UV exposure can damage skin-cell DNA. Mutations in genes that control cell division can let cells grow out of control and form cancer.**
3	The worker's wrist and the swimmer's knee may both look red. How do their causes differ, and what other effects might help distinguish them?	**Cleaner directly irritates the worker's skin and causes stinging at the contact site. Bacteria can enter the swimmer's scrape and multiply, causing warmth, swelling, tenderness, or pus.**
4	How does HPV cause a wart, and why would antibiotics used for some bacterial infections not treat it?	**HPV enters through tiny skin breaks and makes infected skin cells grow more rapidly. It is a virus, not a bacterium, so antibiotics used for bacterial infections do not treat the wart.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A cleaner could irritate the skin where it touched the hand, causing stinging. Bacteria could enter the cut and multiply, leading to warmth, swelling, or pus. Did cleaner touch the red patch? Did the patch appear after the cut and begin to spread?

Accept other accurate effects from the passage. The investigation questions should help distinguish an irritant exposure from bacteria entering through the cut; redness alone is not enough to identify the cause.