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NAME _____ LAB TIME/DATE _____

REVIEW SHEET
exercise
7

The Integumentary System

Basic Structure of the Skin

1. Complete the following statements by writing the appropriate word or phrase on the correspondingly numbered blank:

The two basic tissues of which the skin is composed are dense irregular connective tissue, which makes up the dermis, and __1__, which forms the epidermis. The tough water-repellent protein found in the epidermal cells is called __2__. The pigments melanin and __3__ contribute to skin color. A localized concentration of melanin is referred to as a __4__.

1. *stratified squamous epithelium*
2. *keratin*
3. *carotene*
4. *freckle*

2. Four protective functions of the skin are *Prevents dessication, protects against thermal damage, prevents bacterial invasion, and protects against UV radiation.*.

3. Using the key choices, choose all responses that apply to the following descriptions.

Key:
a. stratum basale
b. stratum corneum
c. stratum granulosum
d. stratum lucidum
e. stratum spinosum
f. papillary layer
g. reticular layer
h. epidermis as a whole
i. dermis as a whole

d; stratum lucidum 1. translucent cells in thick skin containing keratin fibrils

b & d; strata corneum and lucidum 2. dead cells

f; papillary layer 3. dermis layer responsible for fingerprints

i; dermis (or f, g) 4. vascular region

h; epidermis 5. major skin area that produces derivatives (nails and hair)

a; stratum basale 6. epidermal region exhibiting the most rapid cell division

b; stratum corneum 7. scalelike dead cells, full of keratin, that constantly slough off

e; stratum spinosum 8. mitotic cells filled with intermediate filaments

i; dermis (or g) 9. has abundant elastic and collagenic fibers

a; stratum basale 10. location of melanocytes and Merkel cells

e; stratum spinosum 11. area where weblike prekeratin filaments first appear

f; papillary layer 12. region of areolar connective tissue

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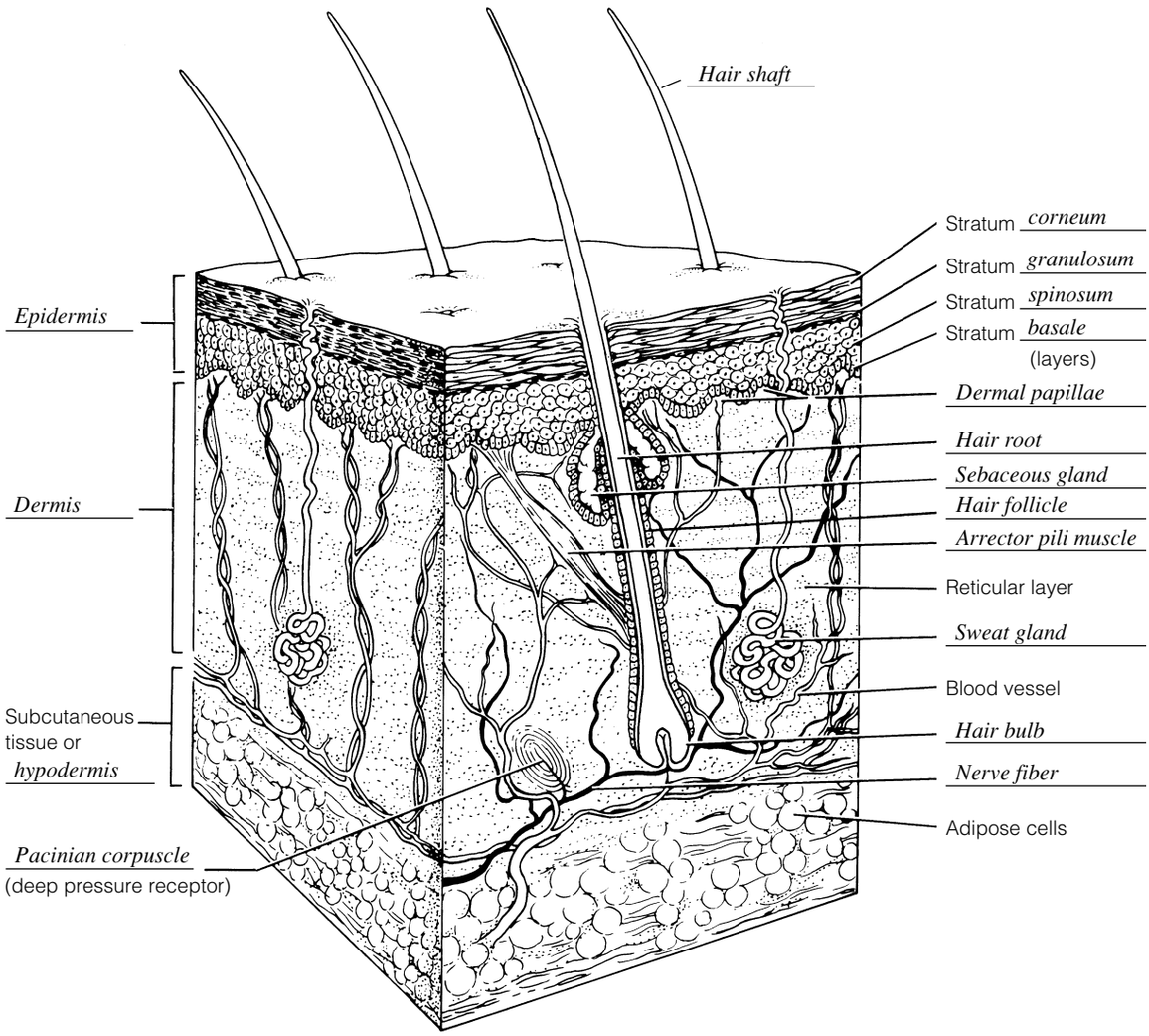
4. Label the skin structures and areas indicated in the accompanying diagram of thin skin. Then, complete the statements that follow.



a. *Laminated (or lamellated)* granules extruded from the keratinocytes prevent water loss by diffusion through the epidermis.

b. Fibers in the dermis are produced by *fibroblasts*.

c. Glands that respond to rising androgen levels are the *sebaceous (and apocrine sweat)* glands.

d. Phagocytic cells that occupy the epidermis are called *Langerhans' cells*.

e. A unique touch receptor formed from a stratum basale cell and a nerve fiber is a *Merkel disc*.

f. What layer is present in thick skin but not in thin skin? *Stratum lucidum*

g. What cell-to-cell structures hold the cells of the stratum spinosum tightly together? *Desmosomes*

5. What substance is manufactured in the skin (but is not a secretion) to play a role elsewhere in the body?

Vitamin D

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6. List the sensory receptors found in the dermis of the skin. *Pain, pressure, touch, heat, and cold.*

7. A nurse tells a doctor that a patient is cyanotic. Define cyanosis. *A blue cast to the skin.*

What does its presence imply? *Inadequate oxygenation of the blood.*

8. What is the mechanism of a suntan? *When exposed to UV radiation, the melanocytes produce more protective melanin and the skin becomes more brown in color.*

9. What is a bedsore (decubitus ulcer) ? *Localized area of tissue necrosis and death.*

Why does it occur? *Pressure areas (points of increased pressure over bony areas) restrict the blood supply to the area.*

10. Some injections hurt more than others. On the basis of what you have learned about skin structure, can you determine why this is so? *It depends on the relative number of pain receptors stimulated.*

Appendages of the Skin

11. Using key choices, respond to the following descriptions.

Key:
a. arrector pili
b. cutaneous receptors
c. hair
d. hair follicle
e. nail
f. sebaceous glands
g. sweat gland—apocrine
h. sweat gland—eccrine

f; sebaceous glands 1. produces an accumulation of oily material that is known as a blackhead

a; arrector pili 2. tiny muscles, attached to hair follicles, that pull the hair upright during fright or cold

h; sweat gland—eccrine 3. perspiration glands with a role in temperature control

d; hair follicle 4. sheath formed of both epithelial and connective tissues

g; sweat gland—apocrine 5. less numerous type of perspiration-producing gland; found mainly in the pubic and axillary regions

f; sebaceous glands 6. found everywhere on body except palms of hands and soles of feet

c, e; hair, nail 7. primarily dead/keratinized cells

b; cutaneous receptors 8. specialized nerve endings that respond to temperature, touch, etc

f; sebaceous glands 9. its secretion is a lubricant for hair and skin

e; nail 10. "sports" a lunula and a cuticle

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12. Describe two integumentary system mechanisms that help in regulating body temperature. *(1) When capillary blood flow to the skin is enhanced (by nervous system controls), heat radiates from the skin surface; restriction of blood flow conserves body heat. (2) Activity of sweat glands, i.e., when perspiration evaporates from the skin surface, heat is lost.*

13. Several structures or skin regions are listed below. Identify each by matching its letter with the appropriate area on the figure.

a. Adipose cells

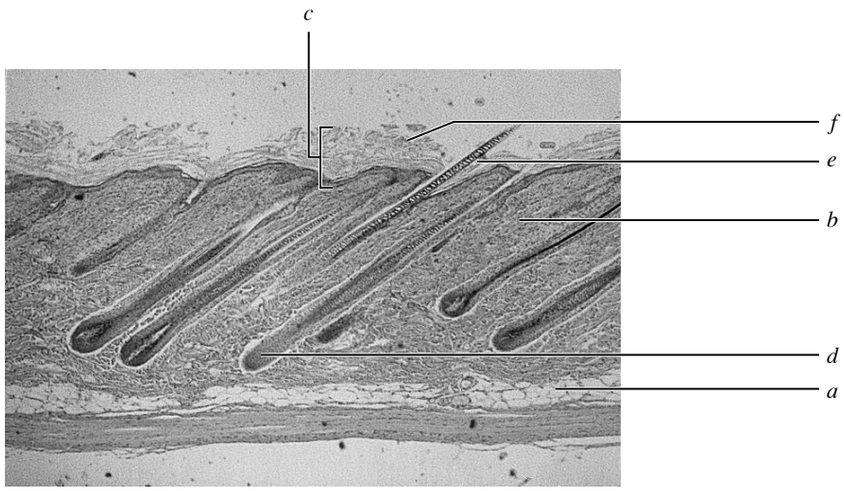
b. Dermis

c. Epidermis

d. Hair follicle

e. Hair shaft

f. Sloughing stratum corneum cells



Plotting the Distribution of Sweat Glands

14. With what substance in the bond paper does the iodine painted on the skin react? *The starch*

15. Based on class data, which skin area—the forearm or palm of hand—has more sweat glands? *Palm*

Was this an expected result? *Yes* Explain. *For most people, hands sweat more than the forearm.*

Which other body areas would, if tested, prove to have a high density of sweat glands? *Face, axillae*

16. What organ system controls the activity of the eccrine sweat glands? *Nervous system (sympathetic division)*

Dermography: Fingerprinting

17. Why can fingerprints be used to identify individuals?

Everyone's fingerprints are genetically distinct.

18. Name the three common fingerprint patterns.

loops, *arches*, and *whorls*