The Skin
(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 connective tissue, which makes up the dermis, and __1__, which forms the epidermis. Most cells of the epidermis are __2__. The protein __3__ makes the dermis tough and leatherlike. The specialized cells that produce the pigments that contribute to skin color are called __4__.

   1. KERATINIZED STRATIFIED EPITHELIUM
   2. DEAD
   3. COLLAGEN
   4. MELANOCYTES

2. Name four protective functions of the skin: __INSULATES__, __CUSHIONS__, __PROTECT FROM__, __MECHANICAL__, __CHEMICAL__, __THERMAL__

   __DAMAGE__, __BACTERIAL__

   __INVASION__

3. Using the key choices, choose all responses that apply to the following descriptions. (Some choices may be used more than once.)

   **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)

   **STRATUM GRANULOSUM**
   1. layer containing sacs filled with fatty material or keratin subunits

   **STRATUM CORNEUM**
   2. dead cells

   **PAPILLARY LAYER**
   3. the more superficial dermis layer

   **EPIDERMIS**
   4. avascular region

   **DERMIS**
   5. major skin area where derivatives (nails and hair) reside

   **STRATUM BASALE**
   6. epidermal region exhibiting the most mitoses

   **STRATUM CORNEUM**
   7. most superficial epidermal layer

   **DERMIS**
   8. has abundant elastic and collagenic fibers

   **STRATUM BASALE**
   9. region where melanocytes are most likely to be found

   **STRATUM CORNEUM**
   10. accounts for most of the epidermis
4. Label the skin structures and areas indicated in the accompanying diagram of skin.

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

   vitamin D

6. How did the results you obtained in Activity 2, “Visualizing Changes in Skin Color Due to Continuous External Pressure,” relate to formation of decubitus ulcers? (Use your textbook if necessary.)

   When pressure applied, shuts down blood flow to skin, if prolonged cells of skin die forming decubitus ulcers

7. Some injections hurt more than others. On the basis of what you have learned about skin structure, can you determine why this is so? Some areas of the skin have greater or lesser amounts of nerve endings to detect pain
8. Two questions regarding general sensation are posed below. Answer each by placing your response in the appropriately numbered blanks to the right.

1–2. Which two body areas tested were most sensitive to touch? 1–2. **Palm + Finger Tip**
3–4. Which two body areas tested were the least sensitive to touch? 3–4. **Back of Hand, Back of Neck**

9. Define adaptation of sensory receptors: **Response slows + finally stops**

10. Why is it advantageous to have pain receptors that are sensitive to all vigorous stimuli, whether heat, cold, or pressure? **To minimize damage from severe heat, cold, pressure**

Pain receptors do not adapt. Why is this important? **To make sure you do something to make the pain stimulus stop**

11. Imagine yourself without any cutaneous sense organs. Why might this be very dangerous? **Severe, heat, cold, pressure would cause much more damage**

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**Appendages of the Skin**

12. Using the key choices, respond to the following descriptions. (Some choices may be used more than once.)

- **Key:**
  - arrector pili muscle
  - cutaneous receptors
  - hair follicle
  - nail
  - sebaceous glands
  - sweat gland—apocrine
  - sweat gland—eccrine

1. acne is an infection of this
2. structure that houses a hair
3. more numerous variety of perspiration gland that produces a secretion containing water, salts, and vitamin C; activated by rise in temperature
4. sheath formed of both epithelial and connective tissues
5. type of perspiration-producing gland that produces a secretion containing proteins and fats in addition to water and salts
6. found everywhere on body except palms of hands and soles of feet
7. primarily dead/keratinized cells
8. specialized nerve endings that respond to temperature, touch, etc.
9. its secretion contains cell fragments
10. “sports” a lunule and a cuticle
13. How does the skin help to regulate body temperature? (Describe two different mechanisms.) **SKIN ACTS AS INSULATOR; SWEAT ON SURFACE IS HEATED BY BLOOD CAUSING EVAPORATION WHICH REMOVES HEAT FROM THE BODY**

14. Several structures or skin regions are lettered in the photomicrograph below. Identify each by matching its letter with the appropriate term that follows.

![Photomicrograph of skin showing different structures labeled a to f]

- **f.** adipose cells
- **e.** dermis
- **d.** hair follicle
- **c.** hair shaft
- **b.** sloughing stratum corneum cells
- **a.** epidermis

**Plotting the Distribution of Sweat Glands**

15. With what substance in the bond paper does the iodine painted on the skin react? **STARCH**

16. Which skin area—the forearm or palm of hand—has more sweat glands? **PALM OF HAND**

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

17. What organ system controls the activity of the eccrine sweat glands? **AUTONOMIC NERVOUS SYSTEM**