

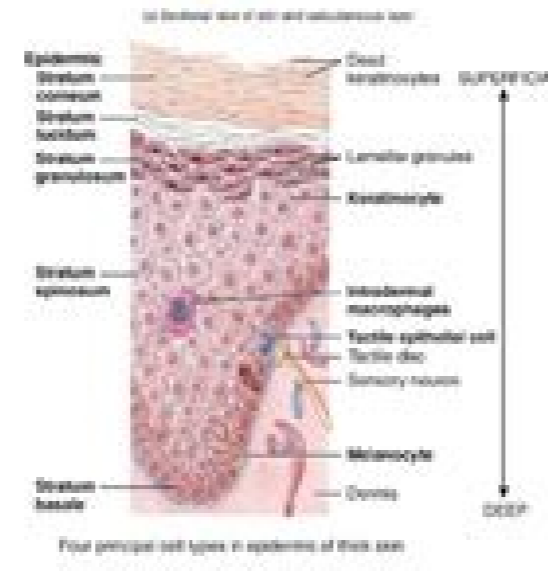
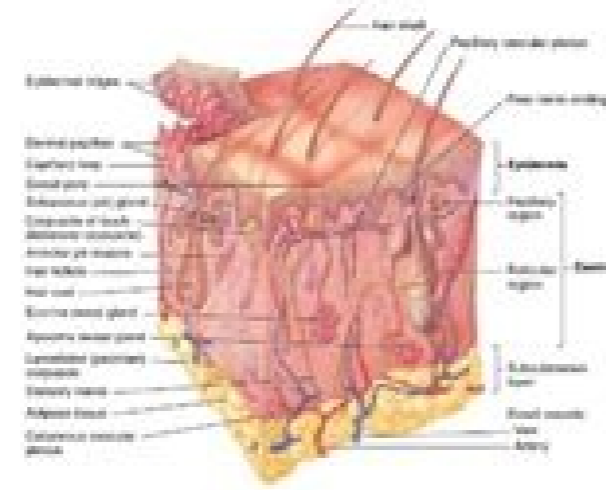
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**Chapter 5: Integumentary System**

- Consists of the skin and accessory structures
- Functions:
  - o Helps maintain body temperature
  - o Converts inactive vitamin D to active form
  - o Provides sensory information
  - o Helps maintain homeostasis

**5.1 Structure of the Skin**

- Two major layers
  - o Epidermis – superficial layer
    - Keratinized, stratified squamous epithelium
    - Avascular
    - Four types of cells:
      - Keratinocytes
      - Melanocytes
      - Intraepidermal macrophages (Langerhans cell)
      - Tactile epithelial cells (Merkel Cell)
    - 4 to 5 layers (thin/thick)
      - Stratum Corneum
        - o dead flat keratinocytes
      - Stratum Lucidum (only in thick skin)
        - o only in fingertips, palms, soles
        - o dead keratinocytes
      - Stratum Granulosum
        - o flattened keratinocytes
        - o cells contain keratohyalin and lamellar granules
      - Stratum Spinosum
        - o Many sided keratinocytes
        - o Contains projections of melanocytes and intraepidermal macrophages
      - Stratum Basale
        - o Deepest layer
        - o Single row of cuboidal/columnar keratinocytes
        - o Melanocytes and tactile epithelial cells
  - o Dermis – layer deep to epidermis
    - Composed of connective tissue (collagen and elastic fibers)
    - Two regions:
      - Papillary – superficial portion
        - o Areolar connective tissue
        - o Thin collagen and fine elastic fibers
        - o Dermal ridges with blood capillaries, corpuscles of touch, and free nerve endings



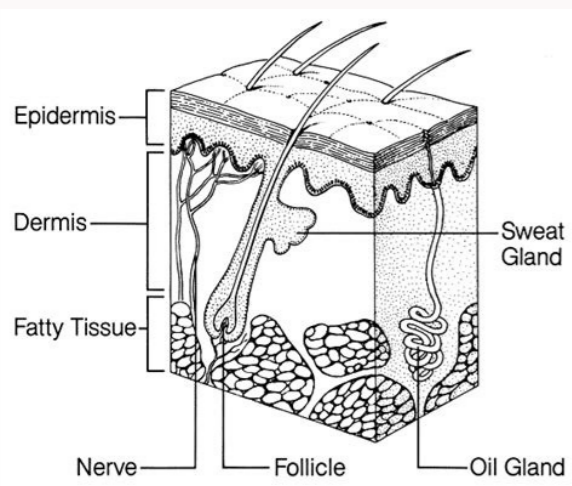
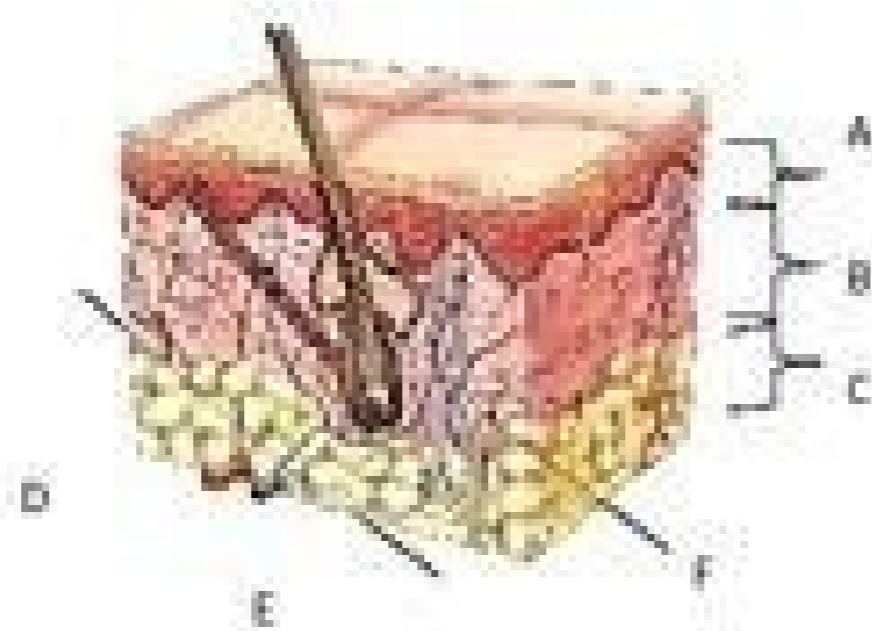
Name \_\_\_\_\_ Date \_\_\_\_\_

**THE INTEGUMENTARY SYSTEM**

1. List the 3 layers of skin
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
2. List the 3 pigments found in human skin
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
3. An area of thickened epidermis is called a \_\_\_\_\_.
4. A \_\_\_\_\_ forms when the skin is exposed to excessive friction or intense heat.
5. Besides perspiration, how else does skin function to keep you cool?

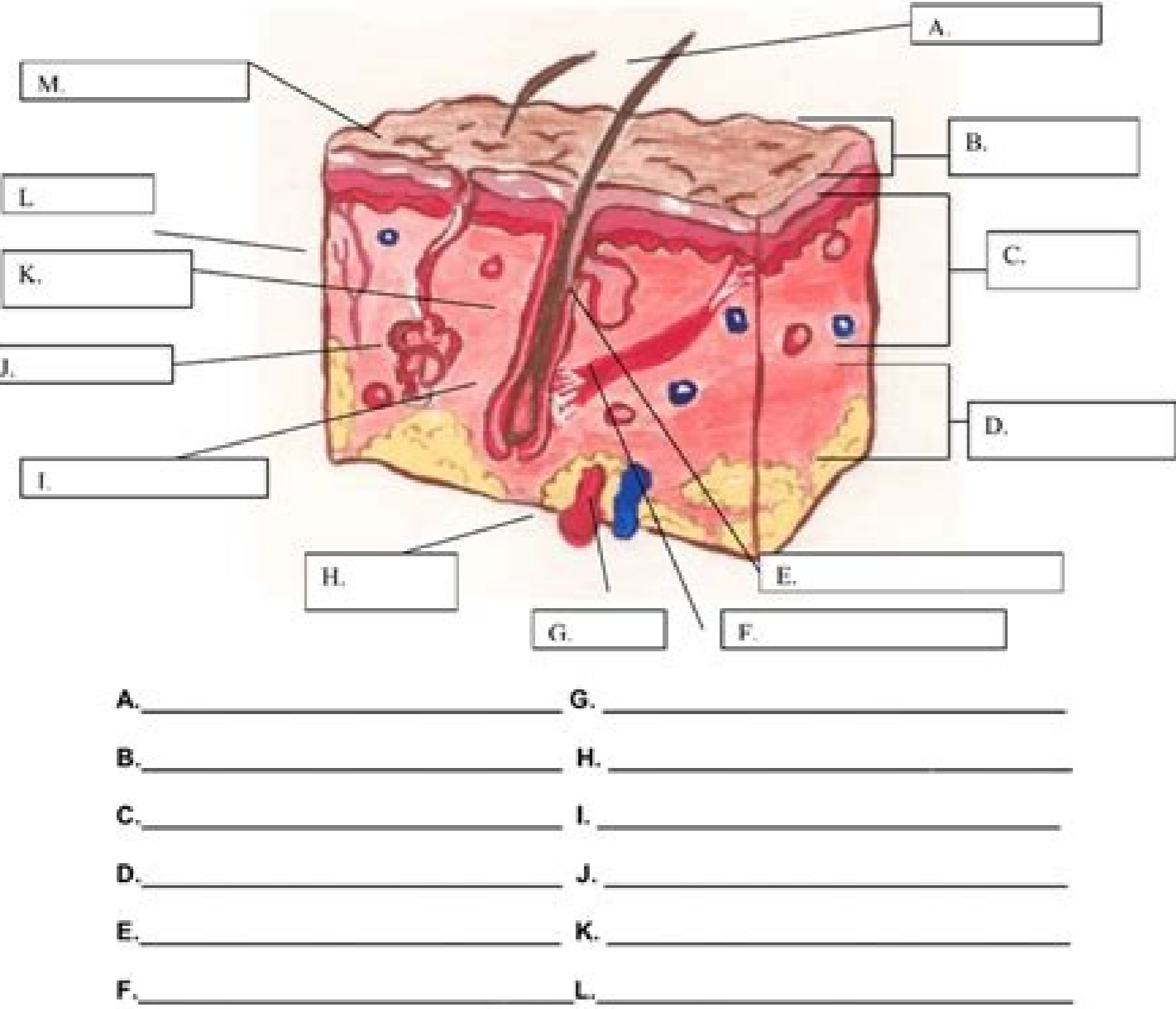
Label the following diagram

1. Name structure A \_\_\_\_\_
2. Name structure B \_\_\_\_\_
3. Name structure C \_\_\_\_\_
4. Name structure D \_\_\_\_\_
5. Name structure E \_\_\_\_\_
6. Name structure F \_\_\_\_\_



**Worksheet**  
**The Integumentary System**

**1. Label the diagram in the spaces provided.**



- |    |    |
|----|----|
| A. | G. |
| B. | H. |
| C. | I. |
| D. | J. |
| E. | K. |
| F. | L. |

Anatomy I

Integumentary System

Answer Key

Write true if the statement is true or false if the statement is false.

- True \_\_\_ 1. The skin is the body's largest organ.
- True \_\_\_ 2. Subcutaneous tissue lies underneath the dermis.
- False \_\_\_ 3. The epidermis has lots of blood vessels.
- True \_\_\_ 4. Melanocytes are located in the bottom layer of the epidermis.
- False \_\_\_ 5. The epidermis contains the hair follicles.
- True \_\_\_ 6. If a sebaceous gland becomes plugged and infected, it develops into a pimple.
- True \_\_\_ 7. The subcutaneous tissue contains about 90 percent of the body's fat.
- False \_\_\_ 8. The evaporation of sweat helps increase the temperature of the skin surface.
- False \_\_\_ 9. The skin makes vitamin A through exposure to UV radiation.
- True \_\_\_ 10. UV radiation excites DNA molecules in skin cells.

Functions of Skin: Skin and Homeostasis

The skin has multiple roles in homeostasis, including protection, control of body temperature, sensory reception, water balance, synthesis of vitamins and hormones, and absorption of materials. The skin's main functions are to serve as a barrier to the entry of microbes and viruses, and to prevent water and extracellular fluid loss. Acidic secretions from skin glands also stop the growth of fungi on the skin. Melanocytes form a second barrier protection from the damaging effects of UV radiation. When a microbe gets into the skin (or when the skin is cut) an immune system reaction occurs.

Heat and cold receptors are located in the skin. When the body temperature rises, the hypothalamus sends a nerve signal to the sweat-producing skin glands, causing them to release sweat onto the skin surface. The sweat's evaporation of sweat helps reduce the temperature of the skin surface which cools the body. The hypothalamus also causes dilation of the blood vessels of the skin, allowing more blood to flow into those areas, causing heat to be released from the skin surface. When body temperature falls, the sweat glands constrict and sweat production decreases. If the body temperature continues to fall, the body will start to generate heat by raising the body's metabolic rate and by causing the muscles to shiver.

Transcript Worksheet The Integumentary System 1. Label the diagram in the spaces provided. A. M. B. L. C. K. J. D. I. E. H. G. F. A. G. L. B. H. C. I.

the three abnormal colors used to describe the skin and what might be the cause of each type? 6. Describe six eruptions that occur in the skin and one cause of each type. 7. What happens in the skin when blood vessels dilate, and how does this regulate temperature? 8. What happens when blood vessels in the skin constrict, and how does this regulate temperature? 9. Describe eight diseases of the skin including the cause and treatment for each disease. 10. Define the parts of a hair and the purpose of hair. 11. Describe what nails are made of and what may happen if the nailbed is damaged. Worksheet The Integumentary System Answer Key Label the diagram in the spaces provided. A. Hair Shaft M. Sweat Pore B. Epidermis L. Nerve C. Dermis K. Hair follicle J. Subcutaneous I. Papilla of hair E. Sebaceous (oil) Gland H. Artery F. Arrector pili muscle A. Hair Shaft M. Sweat Pore B. Epidermis L. Nerve C. Dermis

12. Describe the types of glands in the skin. Sudoriferous glands (Sweat gland): coiled tubes that extend through the dermis and open on the surface of the skin at pores. Sebaceous gland (Oil gland): usually open to hair follicles; they produce sebum, an oil that keeps the skin and hair from becoming dry and brittle. 13. What are the seven functions of the skin? a. Protection-serves as a barrier to the sun's harmful ultraviolet rays and the invasion of pathogens; also holds in moisture and prevents deep tissues from drying out. b. Sensory Perception- nerves in the skin help the body respond to pain, pressure, temperature, and touch sensations. c. Body temperature regulation- blood vessels in the skin help the body retain or lose heat. d. Storage- the skin as tissues for temporary storage of fat, glucose, water, vitamins, and salts. e. Absorption- certain substances can be absorbed through the skin but this is limited. f. Excretion- the skin helps the body eliminate salt, waste, and excess water through perspiration. g. Production- the skin produces vitamin D by combining ultraviolet rays from the sun with skin compounds. 14. Name three substances found in perspiration. Water, salts, and some body wastes. 15. What are the three abnormal colors used to describe the skin, and what might be the cause of each type? Erythema- reddish color, can be caused by burns or a congestion of blood in the vessels Jaundice- yellowish color; can be caused by liver disease. Cyanosis- bluish color of the skin caused by insufficient oxygen; can be associated with heart, lung, or circulatory diseases. 16. Describe six eruptions that occur in the skin and one cause of each type. a. Macules (macular rash)- flat spots on the skin such as chickenpox or measles. b. Papules (papular rash)- small, raised bumps on the skin. c. Vesicles (vesicular rash)- small, fluid-filled blisters. d. Blisters (blistering)- larger fluid-filled blisters. e. Hives (urticaria)- raised, itchy, red patches on the skin. f. Eczema (eczematous rash)- itchy, red, and scaly patches on the skin.

17. What happens in the skin when blood vessels dilate, and how does this regulate temperature? Blood vessels dilate, allowing more blood to flow into the skin, which causes the skin to feel warm. 18. What happens when blood vessels in the skin constrict, and how does this regulate temperature? Blood vessels constrict, reducing blood flow to the skin, which causes the skin to feel cool. 19. Describe eight diseases of the skin including the cause and treatment for each disease. Eczema: Itchy, red, and scaly patches on the skin caused by inflammation. Psoriasis: Red, scaly patches on the skin caused by overproduction of skin cells. Dermatitis: Inflammation of the skin caused by irritants. Rosacea: Redness and bumps on the face caused by blood vessel dysfunction. Acne: Bumps on the skin caused by clogged pores. Melanoma: A type of skin cancer caused by melanocytes. Basal cell carcinoma: A type of skin cancer caused by basal cells. Squamous cell carcinoma: A type of skin cancer caused by squamous cells. 20. Define the parts of a hair and the purpose of hair. The parts of a hair are the hair shaft, hair root, and hair bulb. The purpose of hair is to provide insulation and protection. 21. Describe what nails are made of and what may happen if the nailbed is damaged. Nails are made of keratin. If the nailbed is damaged, the nail may become discolored or fall out. 22. Describe the types of glands in the skin. There are three types of glands: sebaceous glands, sweat glands, and eccrine glands. 23. What are the seven functions of the skin? The seven functions are: protection, temperature regulation, sensory perception, storage, excretion, production, and absorption. 24. Name three substances found in perspiration. Water, salts, and body wastes. 25. What are the three abnormal colors used to describe the skin, and what might be the cause of each type? Erythema, jaundice, and cyanosis. 26. 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