MC101 Anatomy and Physiology Laboratory
Dry Laboratory (2-Hour Activity)

Student Information

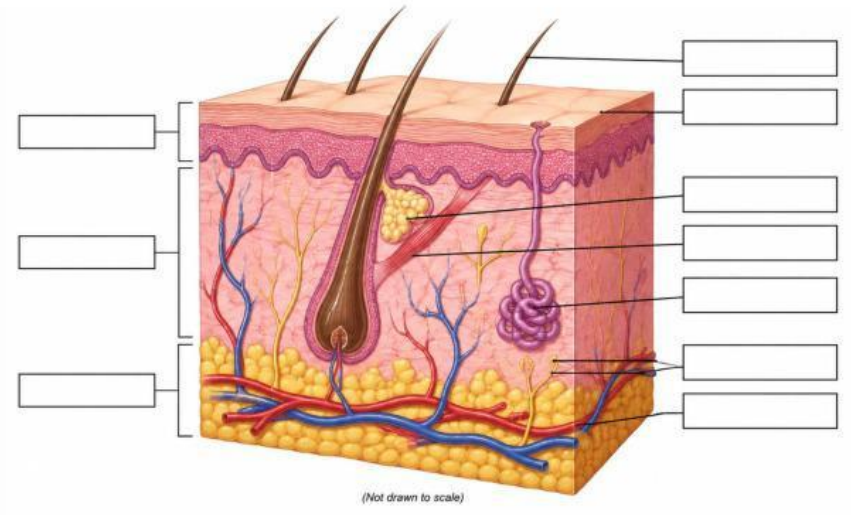
Name	Year & Section	Date	Score

Objectives

- Identify the major layers of the skin.
- Describe the accessory structures of the integumentary system.
- Explain the major functions of the skin.
- Recognize common skin injuries.

Activity 1. Label the Skin

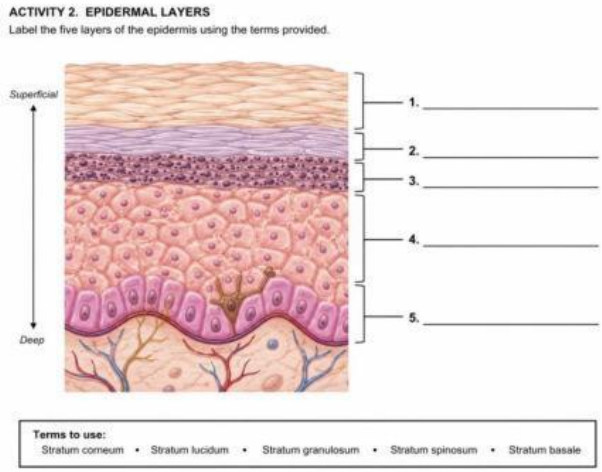
Using the skin diagram, label the epidermis, dermis, hypodermis, hair follicle, hair shaft, sebaceous gland, sweat gland, arrector pili muscle, blood vessels, and sensory nerve.



Guide Questions:
1. Which layer contains blood vessels? _____
2. Which layer contains adipose tissue? _____
3. Which layer protects against microorganisms? _____

Activity 2. Epidermal Layers

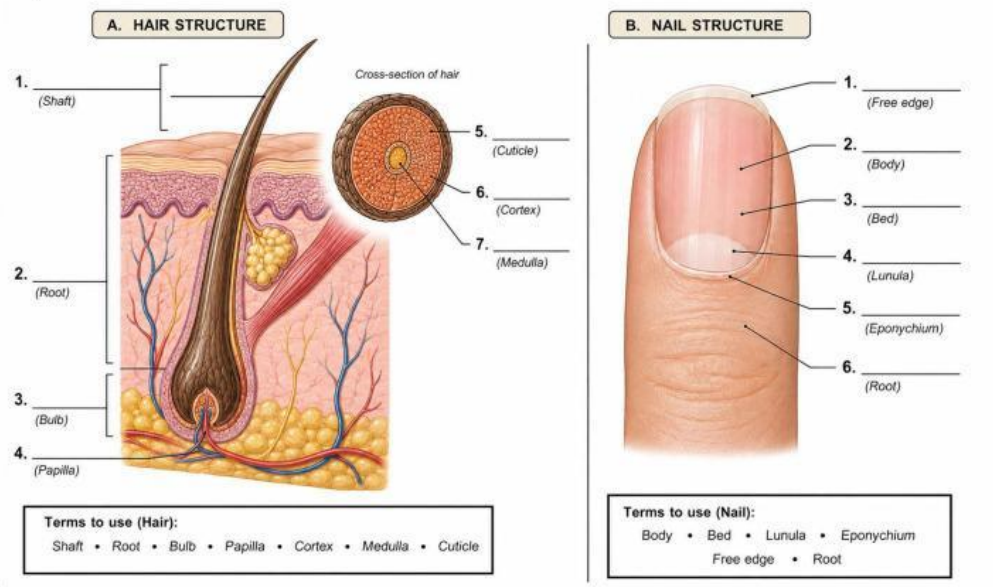
Label: Stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, and stratum basale.



Guide Questions:
1. Which layer produces new skin cells? _____
2. Which layer contains melanocytes? _____
3. Which layer is found only in thick skin? _____

Activity 3. Hair and Nail Structures

Label the parts of the hair (shaft, root, bulb, papilla, cortex, medulla, cuticle) and nail (body, bed, lunula, eponychium, free edge, root).



Questions:

1. Function of hair: _____
2. Function of nails: _____

Activity 4. Skin Functions

Complete the following:

• Match skin structures with their functions.

Directions: Write the letter of the correct function on the blank before each skin structure.

SKIN STRUCTURES	FUNCTIONS
_____ 1. Sweat (sudoriferous) gland	**A.** Produces oil (sebum) to lubricate and waterproof the skin and hair.
_____ 2. Sebaceous (oil) gland	**B.** Produces sweat to cool the body and excrete wastes.
_____ 3. Melanocytes	**C.** Detects light touch and fine touch.
_____ 4. Hair	**D.** Detects deep pressure and vibration.
_____ 5. Touch (Meissner's) corpuscle	**E.** Produces pigment (melanin) that gives skin color and protects from UV radiation.
_____ 6. Pacinian (lamellated) corpuscle	**F.** Provides the body's first line of defense against microorganisms and prevents water loss.
_____ 7. Blood vessels	**G.** Helps regulate body temperature by vasodilation and vasoconstriction.
_____ 8. Keratinized stratified epithelium (epidermis)	**H.** Detects pain, temperature, and itch.
_____ 9. Nerve endings (free nerve endings)	**I.** Provides insulation and helps protect the scalp.
_____ 10. Arrector pili muscle	**J.** Causes hair to stand up ("goosebumps") and helps squeeze sebum toward the skin surface.

• **Complete the Skin Pigments table.**

Part B. Complete the Skin Pigments table.

PIGMENT	PRODUCED BY (Cells)	COLOR	FUNCTION(S)	WHERE FOUND
1. **Melanin** 	_____	_____	_____	_____
2. **Carotene** 	_____	_____	_____	_____
3. **Hemoglobin** 	_____	_____	_____	_____
4. **Bilirubin** 	_____	_____	_____	_____
5. **Oxyhemoglobin** 	_____	_____	_____	_____

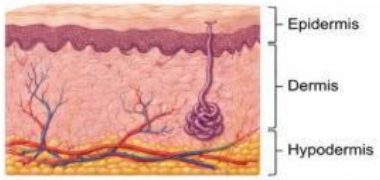
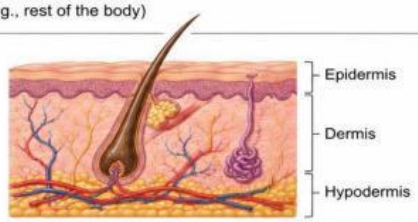
Word Bank *(use as needed):*

Melanocytes | Keratinocytes in hair follicle bulb | Yellow to orange | Brown to black | Red | Yellow
Gives skin, hair, and eye color; absorbs UV radiation and protects DNA | Found in epidermis (basal layer)
Found in diet (fruits and vegetables) | Found in dermis (blood in capillaries) | Found in bruises
Found in liver; deposited in skin | Gives yellow color to skin and sclera in jaundice

• **Compare Thick Skin and Thin Skin.**

Part C. Compare Thick Skin and Thin Skin.

Directions: Complete the table by writing the differences between thick skin and thin skin.

FEATURE	THICK SKIN	THIN SKIN
1. **Location**	Found on _____ (e.g., palms of hands, soles of feet)	Found on _____ (e.g., rest of the body)
2. **Diagram**		
3. **Epidermis**	_____ (thick / thin) Very thick stratum corneum	_____ (thick / thin) Thin stratum corneum
4. **Hair**	_____ (present / absent)	_____ (present / absent)
5. **Sebaceous (oil) Glands**	_____ (present / absent)	_____ (present / absent)
6. **Sweat Glands**	_____ (more / fewer) (mostly eccrine)	_____ (more / fewer) (eccrine and apocrine)
7. **Sensory Receptors**	_____ (fewer / more) (mainly pressure receptors)	_____ (fewer / more) (touch, pain, temperature receptors)
8. **Main Functions/ Adaptations**	• Provides protection against _____ • Withstands _____ • Helps prevent _____ loss	• More flexible and _____ • Allows for _____ (e.g., hair movement, sensation) • Helps in _____ and sensation

• **Complete the Skin Functions table.**

Function	Description	Example
Protection		
Temperature Regulation		
Sensation		
Vitamin D Synthesis		
Excretion		

Activity 5. Burns and Rule of Nines

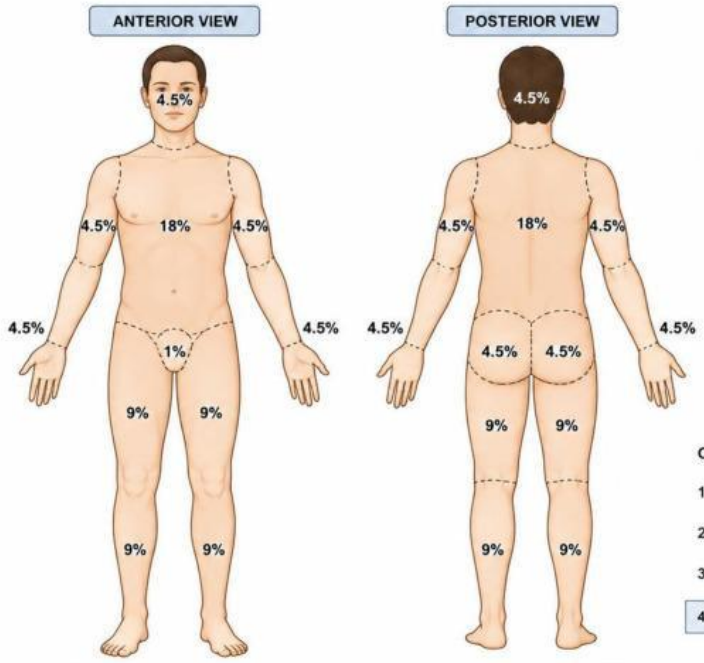
Complete the burn classification table

Burn Degree	Skin Layers Affected	Characteristics	Two Common Causes	Two Treatments
First-Degree Burn			1. 2.	1. 2.
Second-Degree Burn			1. 2.	1. 2.
Third-Degree Burn			1. 2.	1. 2.
Fourth-Degree Burn			1. 2.	1. 2.

Directions: Using the body diagram provided by your instructor, calculate the **Total Body Surface Area (TBSA)** burned.

RULE OF NINES

Directions: Use the body diagram to calculate the Total Body Surface Area (TBSA) burned.



RULE OF NINES KEY	
Head and neck	9%
Each arm	9%
Anterior trunk	18%
Posterior trunk	18%
Each leg	18%
Perineum (genital area)	1%

Total Body Surface Area (TBSA) for adults = 100%

CALCULATE THE TBSA

1. Entire right arm = - _____ %
2. Anterior trunk = - _____ %
3. Left leg = - _____ %
4. **TOTAL TBSA BURNED =** _____ %

GUIDE QUESTIONS

1. Which body part has the largest percentage (excluding head and neck)? _____
2. Why is the Rule of Nines considered only an estimate? _____
3. Why is it important to quickly estimate the TBSA in burn patients? _____

Activity 6. Case Analysis

Case 1: A student developed sunburn after prolonged exposure to sunlight.
1. Which skin layer was primarily affected?
2. Which pigment protects against UV rays?

Case 2: A person touched a hot pan and immediately withdrew the hand.
1. Which receptors detected the heat?
2. Which skin function is demonstrated?