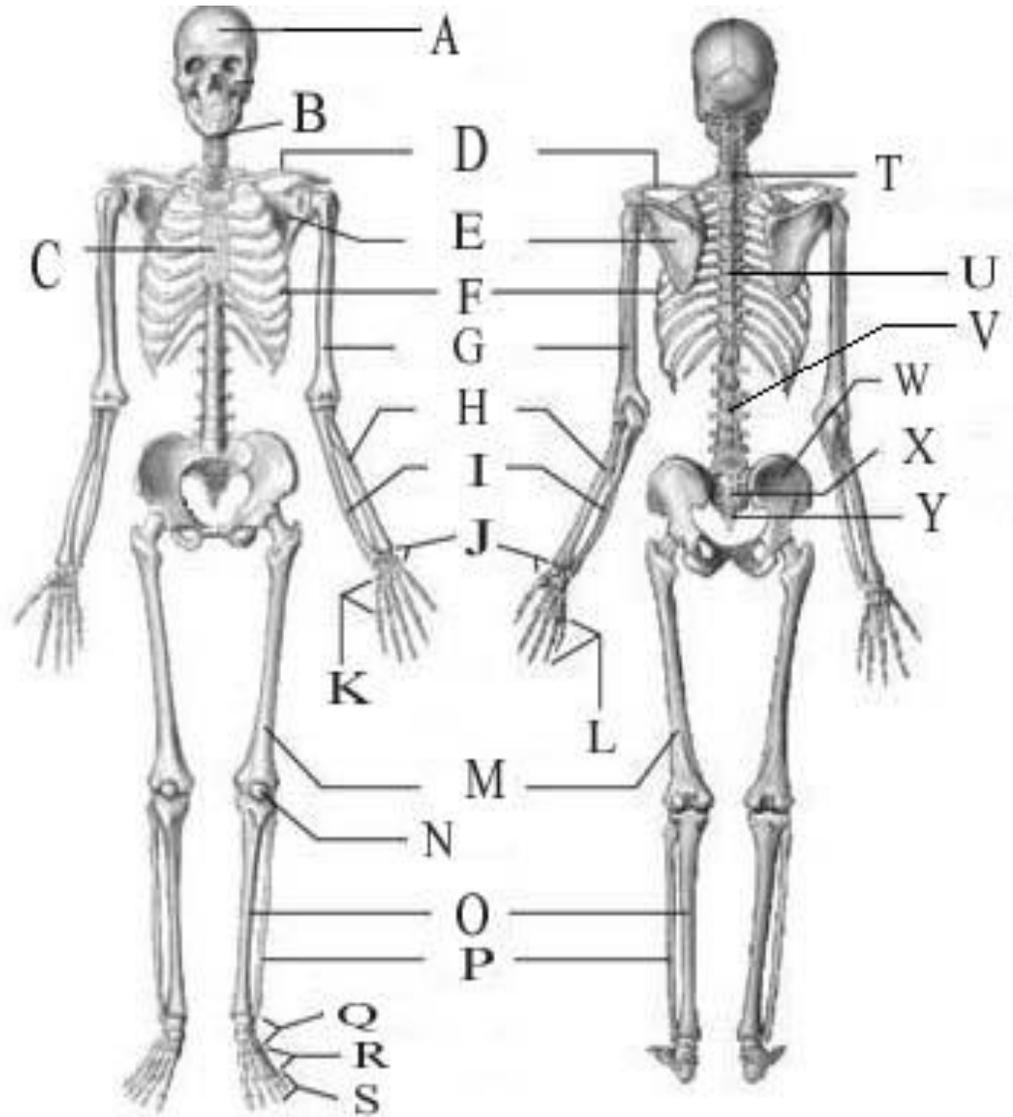


2016 ANATOMY & PHYSIOLOGY (B&C)
Sample Tournament

Station A: Skeleton

Identify the requested bone.

1. Identify B.
2. Identify C.
3. Identify G.
4. Identify K.
5. Identify M.
6. Identify N.
7. Identify P.
8. Identify S.
9. Identify T.
10. Identify W.

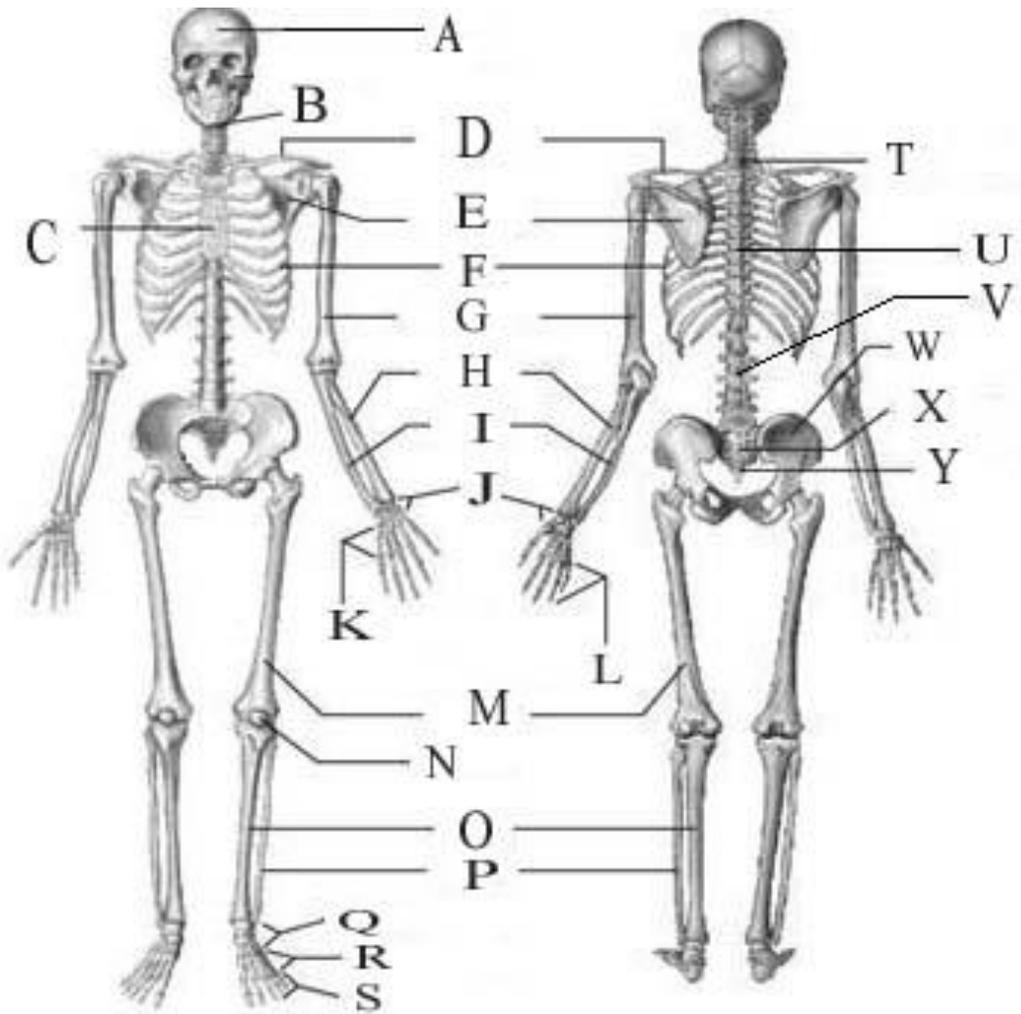


**2016 ANATOMY & PHYSIOLOGY (B&C)
Sample Tournament**

Station A: Skeleton

Identify the requested bone.

1. Identify B.
hyoid
2. Identify C.
sternum
3. Identify G.
humerus
4. Identify K.
metacarpals
5. Identify M.
femur
6. Identify N.
patella
7. Identify P.
fibula
8. Identify S.
phalanges
9. Identify T.
cervical vertebrae
10. Identify W.
pelvic girdle

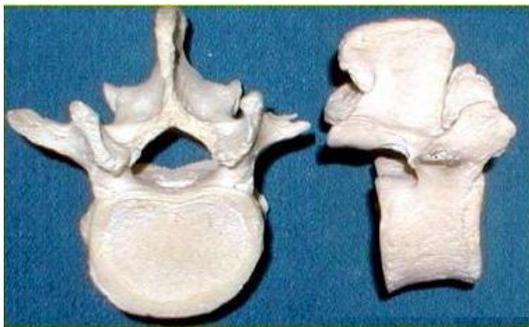


Station B: Vertebrae

Use the diagrams to assist in answering the questions.



A.



B.



C.

11. What type of vertebrae are shown in photo B?
12. How many of this type are there in the skeleton?

13. What type of vertebrae are shown in photo C?
14. How many of this type are there in the skeleton?

15. What type of vertebrae are shown in photo A?
16. How many of this type are there in the skeleton?

17. What is the name of the first vertebrae in photo A?
18. What does it do?

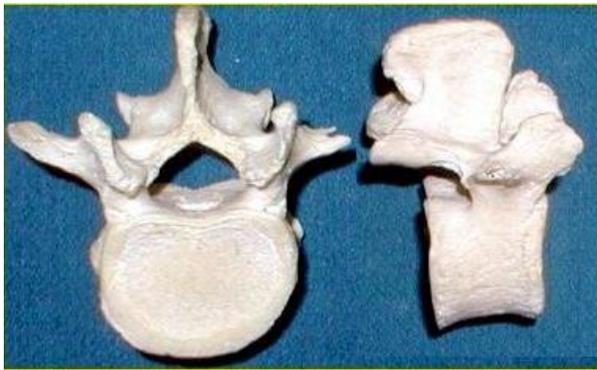
19. What is the name of the second vertebrae in photo A?
20. What does it do?

Station B: Vertebrae

Use the diagrams to assist in answering the questions.



A.



B.



C.

11. What type of vertebrae are shown in photo B? **lumbar vertebrae**
12. How many of this type are there in the skeleton? **5**

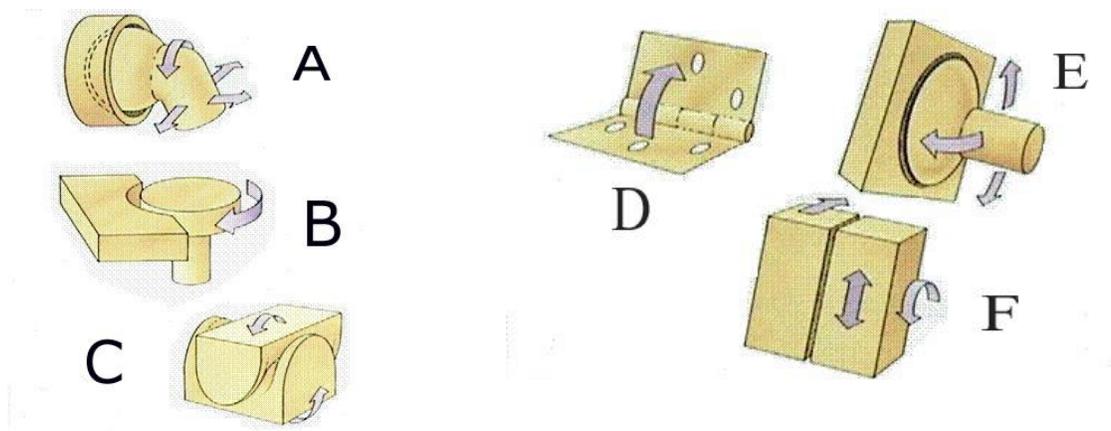
13. What type of vertebrae are shown in photo C? **thoracic vertebrae**
14. How many of this type are there in the skeleton? **12**

15. What type of vertebrae are shown in photo A? **cervical vertebrae**
16. How many of this type are there in the skeleton? **7**

17. What is the name of the first vertebrae in photo A? **Atlas**
18. What does it do? **supports head**

19. What is the name of the second vertebrae in photo A? **axis**
20. What does it do? **pivots to turn head**

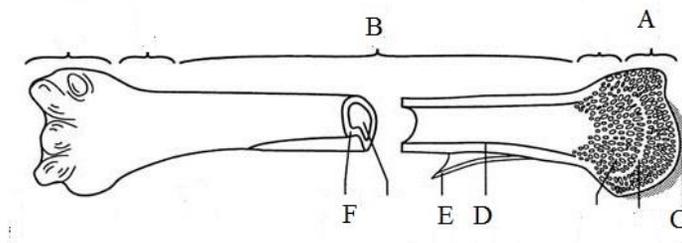
Station C: Joints and Long Bone Anatomy



Identify the joint type and motion range for each joint type listed below. .

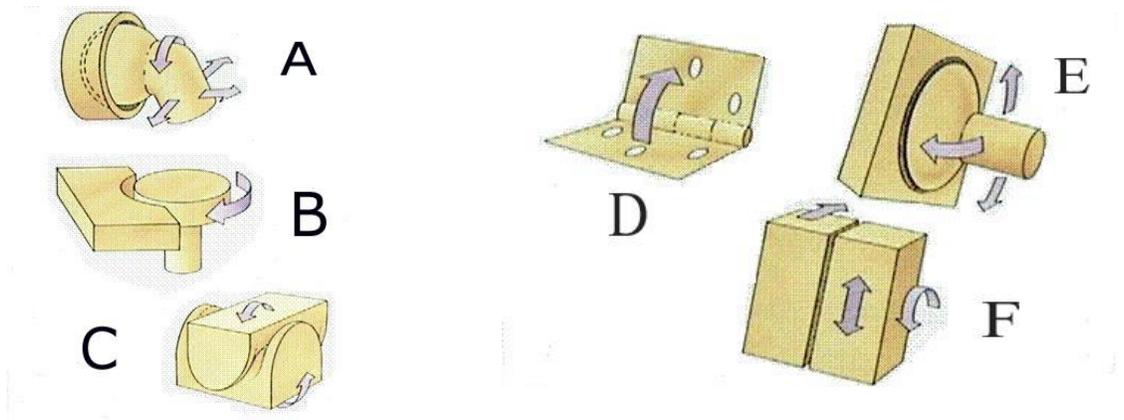
21. Joint type "A".
22. Joint type "B".
23. Joint type "C".
24. Joint type "E".
25. Joint type "F".

For Questions 26-30, give the Letter from the diagram and then describe the structural and functional features for the following parts of a typical long bone



26. periosteum
27. diaphysis
28. epiphysis
29. articular cartilage
30. endosteum

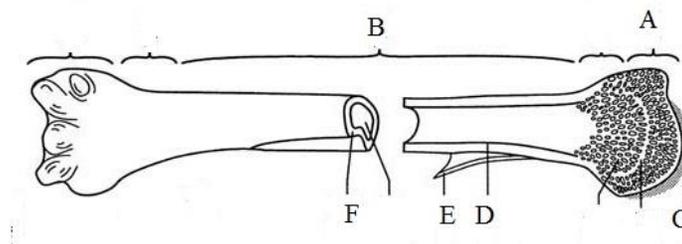
Station C: Joints



Identify the joint and its motion range for each joint type listed below.

21. Joint type "A". **Ball & Socket** - allows for complete range of motion Example: shoulder, hip
22. Joint type "B". **Pivot** – one bone pivots in the arch of another Example: Axis/Atlas, and proximal radioulnar joint
23. Joint type "C". **Saddle** – two directional movement between thumb and trapezium carpel
24. Joint type "E". **Ellipsoid (Condyloid)** – side to side and back & forth Example – radius end into carpal bones
25. Joint type "F". **Plane or Gliding** – least moveable – side to side only Examples: intercarpal & intertarsal joints, between vertebrae

For Questions 26-30, give the Letter from the diagram and then describe the structural and functional features for the following parts of a typical long bone



26. periosteum – E - A dense, white fibrous covering around the surface of bone. Essential for bone growth, repair, and nutrition - Serves as a point of attachment for ligaments and tendons
27. diaphysis - B -The shaft or long, main, portion of the long bone
28. epiphysis - A -The expanded ends of the long bone
29. articular cartilage – C- A thin layer of hyaline cartilage covering the epiphysis in order to reduce friction during the movement of the joint.
30. endosteum –D- A thin layer of squamous cells lining the medullary cavity

Station D: SKELETAL SYSTEM - Effect of Exercise and Medical Conditions

List 5 ways in which exercise helps the skeletal systems.

31.

32.

33.

34.

35.

For each of the following conditions, explain the cause and symptoms.

36. Scoliosis

37. Disk Herniation

38. Osteoarthritis

39. Anterior Cruciate Ligament tears

40. Osteoporosis

Station D: SKELETAL SYSTEM - Effect of Exercise and Medical Conditions

List 5 ways in which exercise helps the skeletal system.

- 31. Increases strength and density in bones**
- 32. Exercise slows decline in minerals and maintains joint mobility**
- 33. Stress of exercise helps the bone tissues to become stronger**
- 34. Ligaments will stretch slightly to enable greater joint flexibility**
- 35. Hyaline cartilage at the ends of the bones becomes thicker and can absorb shock better**

For each of the following conditions, explain the cause and symptoms.

- 36. Scoliosis - A lateral curvature of the spine**
- 37. Disk Herniation - Rupture of the soft tissue that separates two vertebral bones into the spinal canal.**
- 38. Osteoarthritis - A type of arthritis marked by progressive cartilage deterioration in synovial joints and vertebrae**
- 39. Anterior Cruciate Ligament tears – (ACL tear) - The anterior cruciate ligament (ACL) is one of the most important of four strong ligaments connecting the bones of the knee joint-any activity in which the knee is forced into hyperextension and/or internal rotation may result in an ACL tear – It may require surgery to repair it.**
- 40. Osteoporosis - Loss of bone mass that occurs throughout the skeleton. Predisposes people to fractures**

Station E: SKELETAL MUSCLES

Using the front view diagram

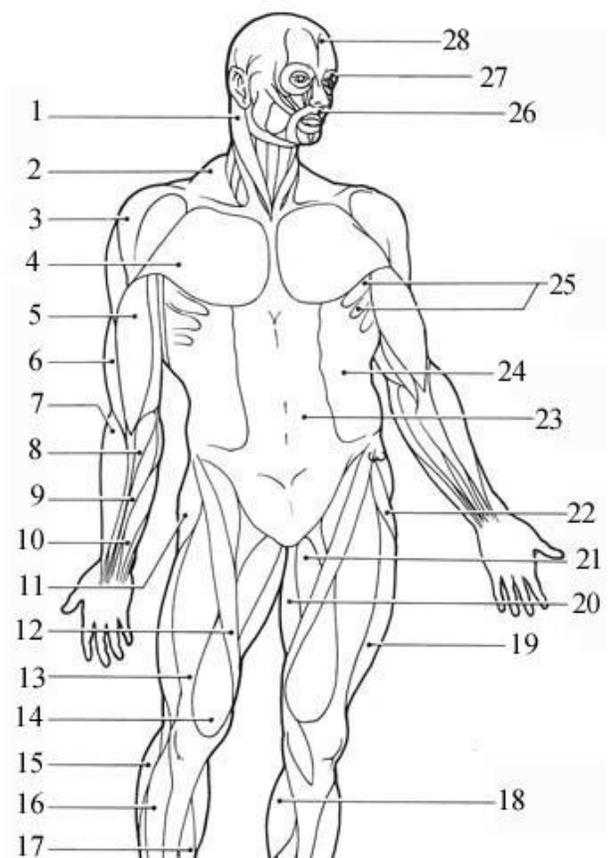
41. Give the name of # 1 .

42. Give the name of # 4 .

43. Give the name of # 23 .

44. Give the name of # 24 .

45. Give the name of # 12.



Using the back view diagram:

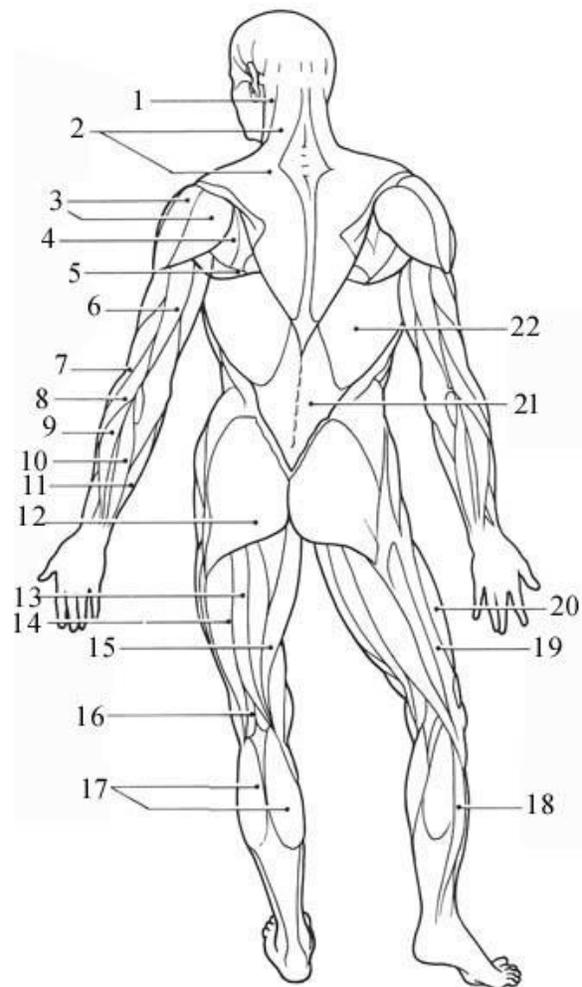
46. Give the name of # 2.

47. Give the name of # 3.

48. Give the name of # 22.

49. Give the name of # 12.

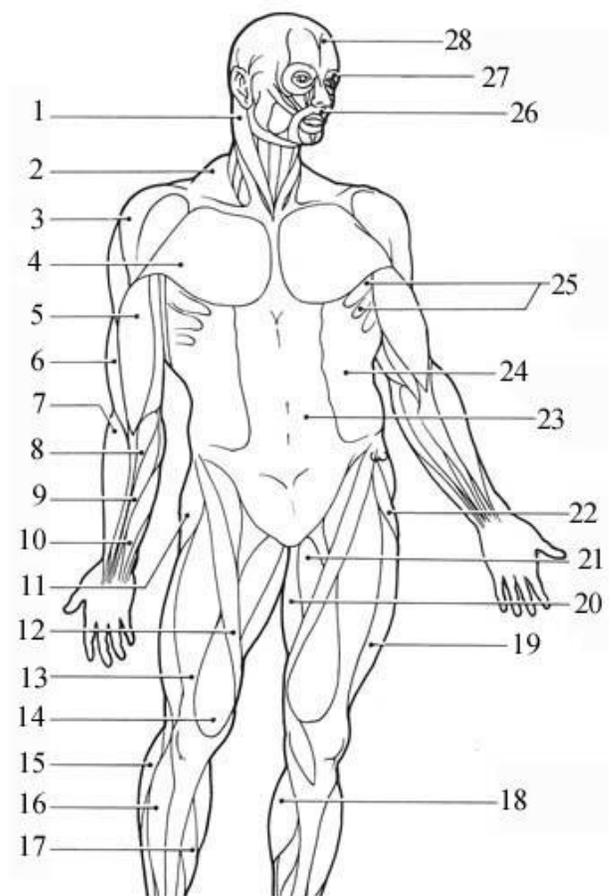
50. Give the name of # 17.



Station E: SKELETAL MUSCLES

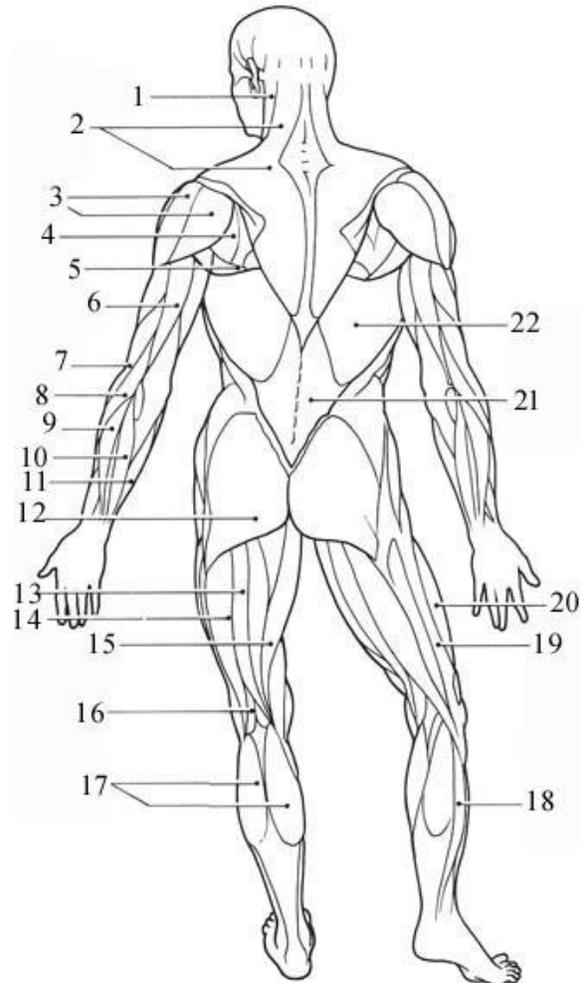
Using the front view diagram

41. Give the name of # 1 .
Sternocleidomastoid
42. Give the name of # 4 .
Pectoralis major
43. Give the name of # 23 .
Rectus abdominis
44. Give the name of # 24 .
External oblique
45. Give the name of # 12.
Sartorius



Using the back view diagram:

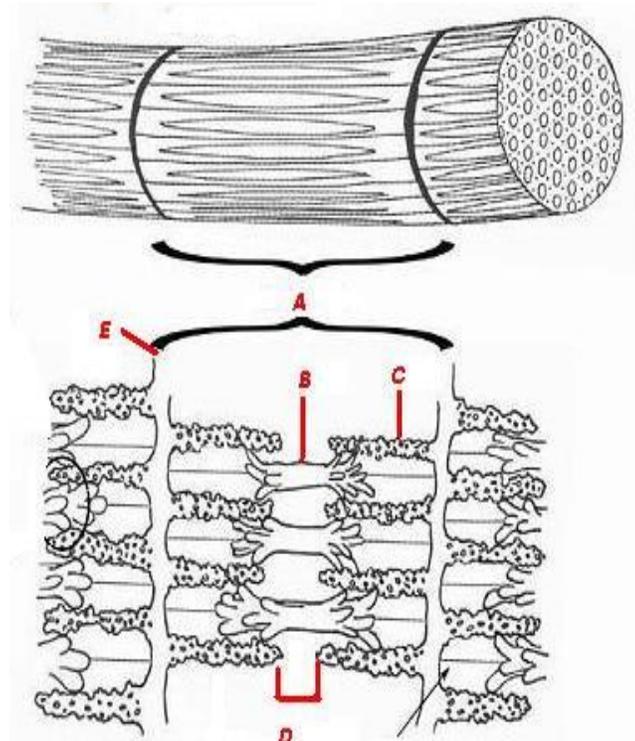
46. Give the name of # 2.
Trapezius
47. Give the name of # 3.
Deltoid
48. Give the name of # 22.
Latissimus dorsi
99. Give the name of # 12.
Gluteus maximus
50. Give the name of # 17.
Gastrocnemius



Station F:

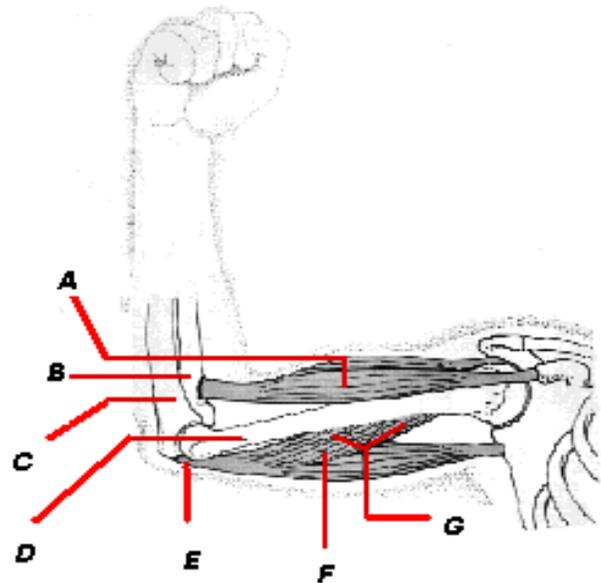
Skeletal Muscle Structure

51. Name the functional unit of the muscle labeled A.
52. What main protein is in the thick filaments labeled B? (actin or myosin)
53. What main protein is in the thin filaments labeled C?
54. What happens to the area labeled D when the muscle contracts?
Bigger or smaller
55. Which filaments (B or C) move in ratchet-like motion as the muscle contracts?



Movement

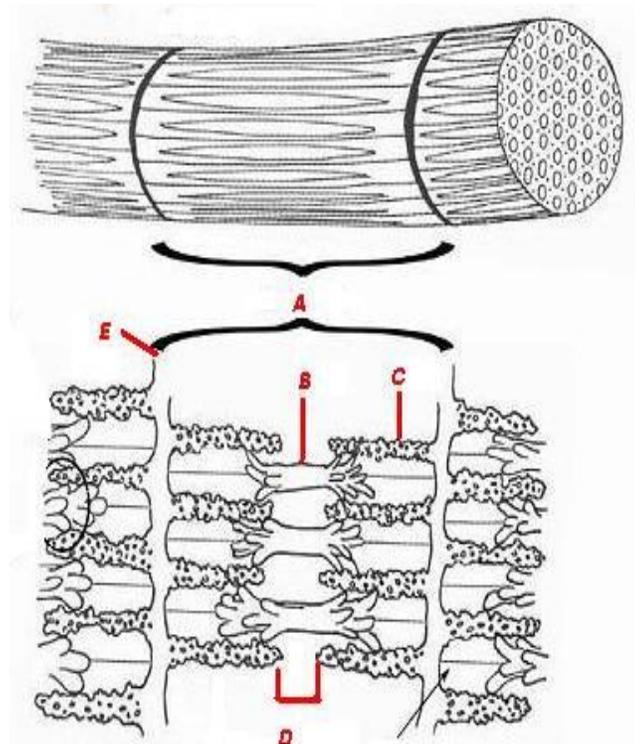
56. What bone is labeled B?
57. What bone is labeled C?
58. What muscle is labeled A?
59. What muscle is labeled F?
60. Which muscle (A or F) is contracted in this diagram ?



Station F:

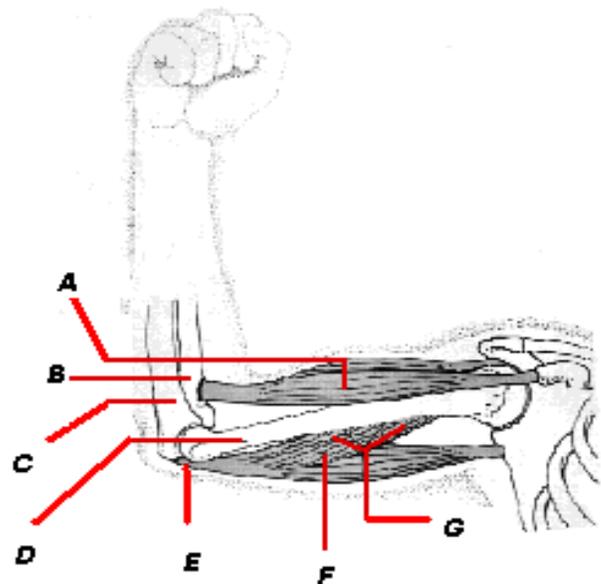
Skeletal Muscle Structure

51. Name the functional unit of the muscle labeled A.
Sarcomere
52. What main protein is in the thick filaments labeled B? (actin or myosin)
myosin
53. What main protein is in the thin filaments labeled C?
actin
54. What happens to the area labeled D when the muscle contracts?
Bigger or smaller
smaller
55. Which filaments (B or C) move in ratchet-like motion as the muscle contracts?
C



Movement

56. What bone is labeled B?
radius
57. What bone is labeled C?
ulna
58. What muscle is labeled A?
biceps
59. What muscle is labeled F?
triceps
60. Which muscle (A or F) is contracted in this diagram?
A



Station G: MUSCULAR SYSTEM - Effects of Exercise and Disorders

List 5 ways in which exercise helps the muscular systems.

61.

62.

63.

64.

65.

For each of the following conditions, explain the cause and symptoms.

66. Poliomyelitis

67. Myasthenia gravis

68. Muscle strain vs. muscle sprain

69. Muscular dystrophy

70. tetanus

Station G: MUSCULAR SYSTEM - Effects of Exercise and Disorders

List 5 ways in which exercise helps the muscular systems.

- 61. Exercise helps muscles become more effective and efficient.**
- 62. Tendons will become thicker and able to withstand greater force**
- 63. High intensity exercise for short duration produces strength, size and power gains in muscles and Low intensity exercise for long durations will give endurance benefits**
- 64 Exercise promotes good posture enabling muscles to work effectively and helps prevent injury**
- 65. Trained muscles have better tone or state of readiness to response**

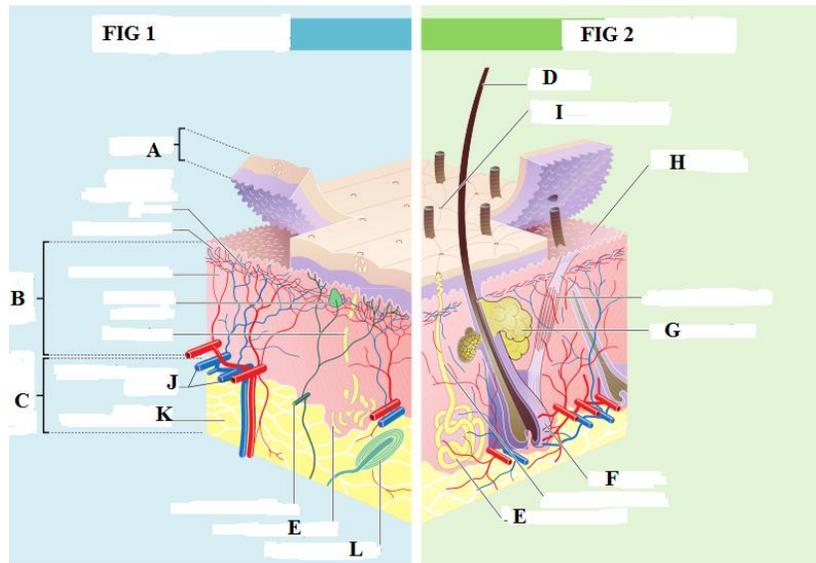
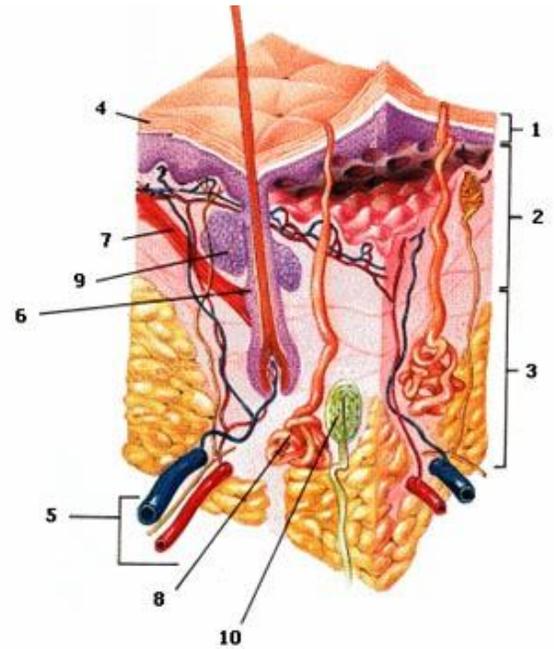
For each of the following conditions, explain the cause and symptoms.

- 66. Poliomyelitis**
viral infection of the nerves that control skeletal muscle movement
- 67. Myasthenia gravis**
autoimmune disease affecting the neuromuscular junction. Patients have smaller end plate potentials due to the antibodies being directed against the receptors. It affects the ability of the impulse to cause the muscle contraction. Administering an inhibitor of acetylcholinesterase can temporarily restore contractibility.
- 68. Muscle strain vs. muscle sprain**
Muscle strain vs. muscle strain - Strains are injuries from overexertion or trauma which involve stretching or tearing of muscle fibers. They often are accompanied by pain and inflammation of the muscle and tendon. If the injury is near a joint and involves a ligament, it is a sprain.
- 69. Muscular dystrophy**
Muscular dystrophy – group of genetic disorders affecting the framework (dystrophin) of the sacromere affecting the muscle's ability to contract. Gene on X chromosome = sex-linked
- 70. tetanus**
a serious bacterial disease that affects your nervous system, leading to painful muscle contractions, particularly of your jaw and neck muscles - Tetanus can interfere with your ability to breathe and, ultimately, threaten your life. Tetanus is commonly known as "lockjaw."

Station H: Human Skin

Refer to the Skin Diagram for Questions 61-65.

71. What is number 1 and what does it do?
72. What is number 2 and what does it do?
73. What is number 3 and what does it do?
74. What is number 8 and what does it do?
75. What is number 9 and what does it do?



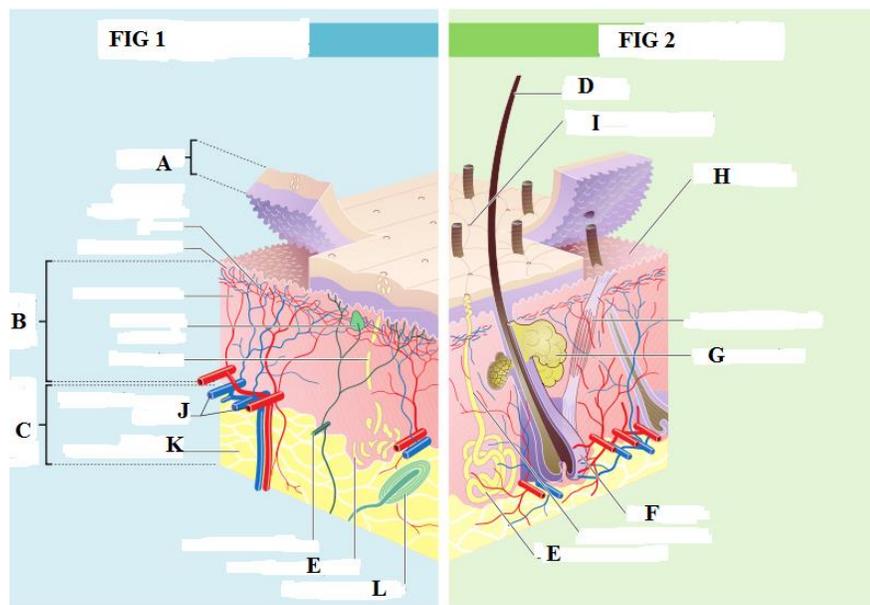
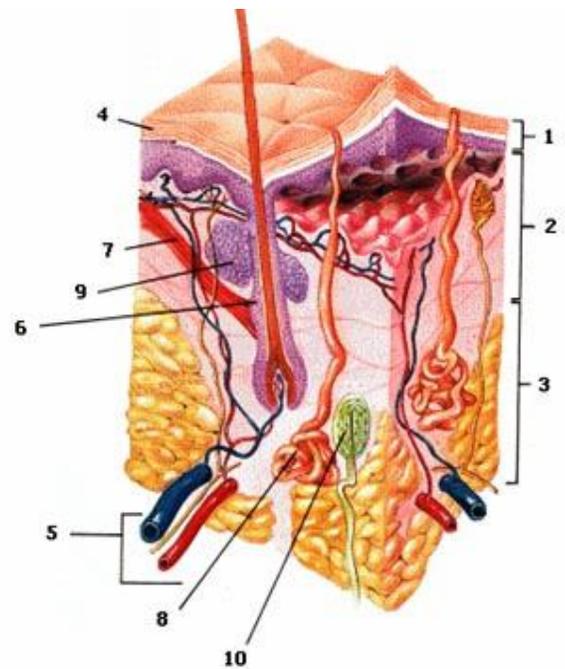
For questions 66-70, use Figures 1 and 2

76. Which Figures (1 or 2) represents thin skin?
77. Where is thin skin found on the body?
78. Which Figure (1 or 2) is thick skin?
79. Where is thick skin found on the body?
80. How is thick skin different from thin skin?

Station H: Human Skin

Refer to the Skin Diagram for Questions 61-65.

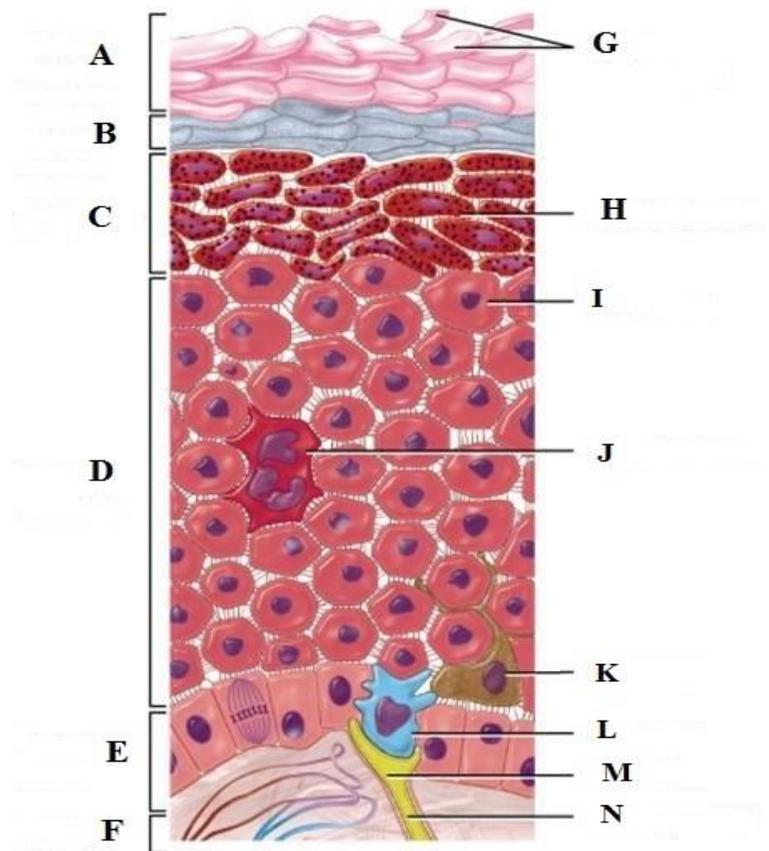
71. What is number 1 and what does it do?
Epidermis – outer layer provides physical, chemical, and biological barriers
72. What is number 2 and what does it do?
Dermis – second layer – has blood vessels, nerves, glands, and hair follicles
73. What is number 3 and what does it do?
Subdermal layer - or hypodermis- below skin – attaches skin to underlying organs and tissues has connective tissue and adipose tissue for insulation
74. What is number 8 and what does it do?
Sweat gland - – produce sweat to cool body
75. What is number 9 and what does it do?
Subcutaneous gland - produce oil which lubricates hair and skin



For questions 66-70, use Figures 1 and 2

76. Which Figures (1 or 2) represents thin skin?
Fig 2
77. Where is thin skin found on the body?
all parts of body except palms of hands and soles of feet
78. Which Figure (1 or 2) is thick skin?
Fig 1
79. Where is thick skin found on the body?
palms of hands and soles of feet
80. How is thick skin different from thin skin?
hairless, has thick epidermis, lacks sebaceous and has more sweat glands plus sense receptors are more densely packed

Station I: Cells and Layers of Skin



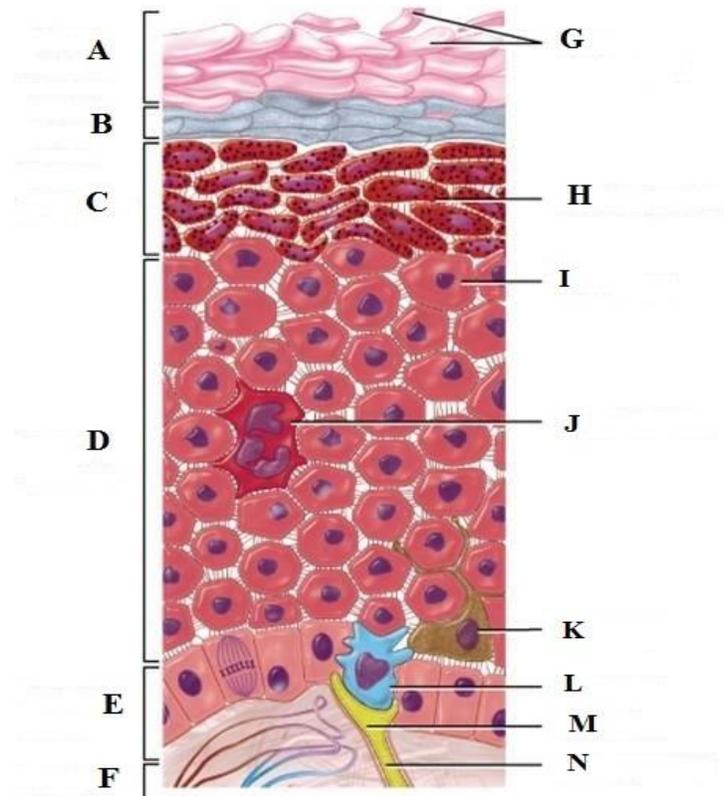
Use A-F for Questions 71-75 (Cell Types) use letters (G-N) on the diagram.

81. Which cell is the melanocyte?
82. Which cell is a live keratinocyte?
83. Which cell is a dead keratinocyte?
84. Which cell is a Merkel cell and helps with touch?
85. Which cell is a Langerhans cell and participates in immune responses?

Use G-L for Questions 76-80 (Cell Layers) use letters (A-F) on the diagram

86. Which layer is present only in thick skin? What is its name?
87. Which layer is where skin cells reproduce? What is its name?
88. Which layer is the layer of dead flat keratinocytes? What is its name?
89. Which layer spine-like projections that tightly join the cells together? What is its name?
90. Which layer marks the transition between deeper metabolically active layers and the dead cells of the superficial strata? What is its name?

Station I: Cells and Layers of Skin



Use A-F for Questions 71-575 (Cell Types) use letters (G-N) on the diagram.

81. Which cell is the melanocyte?

K

82. Which cell is a live keratinocyte?

I

83. Which cell is a dead keratinocyte?

G

84. Which cell is a Merkel cell and helps with touch?

L

85. Which cell is a Langerhans cell and participates in immune responses?

J

Use G-L for Questions 76-80 (Cell Layers) use letters (A-F) on the diagram

86. Which layer is present only in thick skin? What is its name?

B Stratum lucidum

87. Which layer is where skin cells reproduce? What is its name?

E Stratum basale

88. Which layer is the layer of dead flat keratinocytes? What is its name?

A Stratum corneum

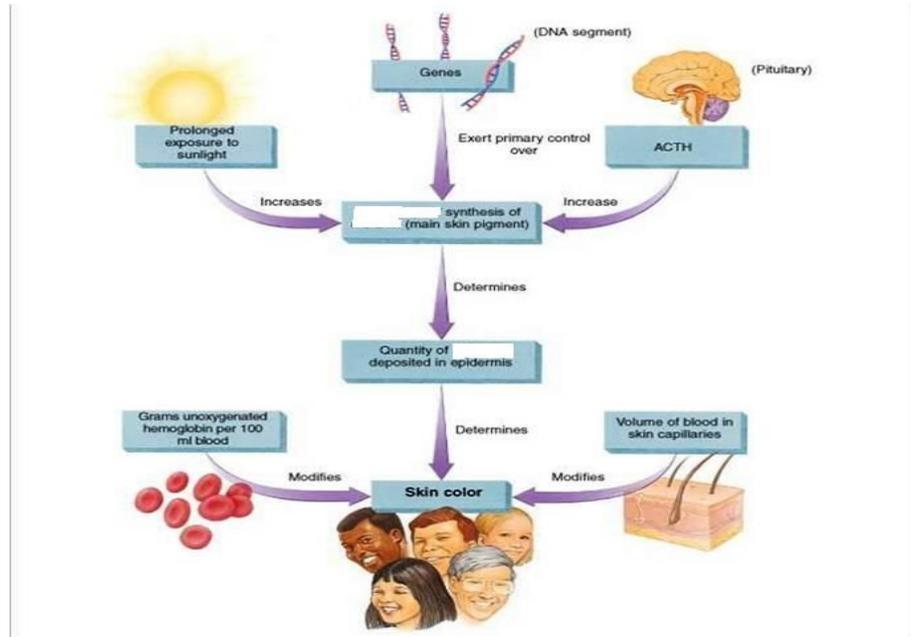
89. Which layer spine-like projections that tightly join the cells together? What is its name?

D Stratum spinosum

90. Which layer marks the transition between deeper metabolically active layers and the dead cells of the superficial strata? What is its name?

B Stratum granulosum

Station J: Skin



91. – 95. What pigments are responsible for skin color and what factors are involved in skin color?
How does UV light affect the skin

96. – 100. How does aging affect the skin and the glands and accessory organs within the skin?

Station J: Skin

91. – 95. What pigments are responsible for skin color and what factors are involved in skin color?
How does UV light affect the skin

Skin Pigments - three pigments are responsible for skin color- melanin, carotene, hemoglobin – genes, sun exposure, volume of blood in the capillaries and RBC unoxygenated blood determine skin color

- *Melanin is located mostly in epidermis*
- *Number of melanocytes are about the same in all races*
- *Difference in skin color is due to the amount of pigment that melanocytes produce and disperse to keratinocytes.*
- *Freckles are caused by the accumulation of melanin in patches*
- *Liver spots are also caused by the accumulation of melanin*
- *Melanocytes synthesize melanin from an amino acid called tyrosine along with an enzyme called tyrosinase. All this occurs in the melanosome which is an organelle in the melanocyte.*
- *Two types of melanin: eumelanin which is brownish black and pheomelanin which is reddish yellow*
- *Fair-skinned people have more pheomelanin and dark skinned people have more eumelanin*
- *UV light increases enzymatic activity in the melanosomes and leads to increased melanin production.*
- *A tan is achieved because the amount of melanin has increased as well as the darkness of the melanin. (Eumelanin provides protection from UV exposure while pheomelanin tends to break down with too much UV exposure)*
- *The melanin provides protection from the UV radiation but prolonged exposure may cause skin cancer.*

96. – 100. How does aging affect the skin and the glands and accessory organs within the skin?

- *Beginning in our 20s, the effects of aging begin to be visible in the skin.*
- *Stem cell activity declines: skin thin, repair difficult*
- *Epidermal dendritic cells decrease: reduced immune response*
- *Vitamin D3 production declines: calcium absorption declines and brittle bones*
- *Glandular activity declines: skin dries, body can overheat*
- *Blood supply to dermis declines: tend to feel cold*
- *Hair follicles die or produce thinner hair*
- *Dermis thins and becomes less elastic – wrinkles*
- *Sex characteristics fade: fat deposits spread out, hair patterns change*
- *Genetically programmed chronologic aging causes biochemical changes in collagen connective tissues that give skin its firmness and elasticity.*
- *The genetic program for each person is different, so the loss of skin firmness and elasticity occurs at different rates and different times in one individual as compared with another.*
- *As skin becomes less elastic, it also becomes drier.*
- *Underlying fat padding begins to disappear.*
- *With loss of underlying support by fat padding and connective tissues, the skin begins to sag. It looks less supple and wrinkles form.*
- *The skin may be itchy with increased dryness. A cut may heal more slowly.*

Station K: Disorders of the Integumentary system

For Questions 101-103, explain the cause and treatment for the following disorders

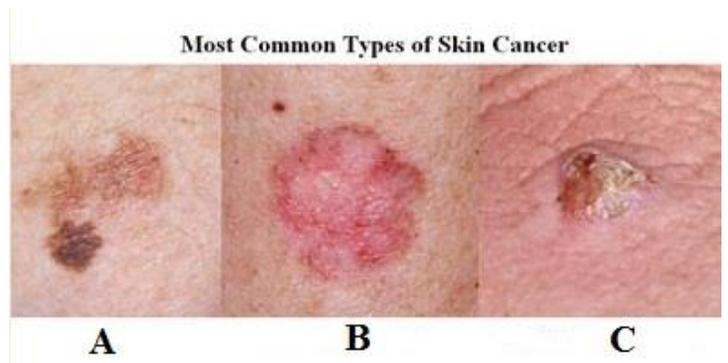
101. Boils and Carbuncles

102. Athletes Foot

103. Impetigo

104. Distinguish between 1st, 2nd, and 3rd degree burns.

For Questions 105-108, use the pictures (A, B, and C) of skin cancer.



105. Which picture is of Basal cell carcinoma?

106. Which picture is of Squamous Cell Carcinoma?

107. Which picture is of Melanoma?

108. Which of these types of skin cancer is the most deadly? Why?

109. Distinguish between irritant and allergic dermatitis.

110. For which type of dermatitis does the reaction usually look like a burn? (Irritant or allergic)

Station K: Disorders of the Integumentary system

For Questions 101-103, explain the cause and treatment for the following disorders

101. Boils and Carbuncles – **Bacterial infections of hair follicles and sebaceous glands especially on the face and sides of the neck** - most are caused by staphylococcus – they are usually treated by opening and draining the boil. It may also require antibiotics.
102. Athletes Foot – **a fungal infection of the foot caused by Tinea** – treated with antifungal medication
103. Impetigo – **a bacterial infection of the skin causing red sores that break open, ooze fluid and develop a yellow-brown crust** – it can be caused by streptococcus or staphylococcus – it is treated with antibiotics.
104. Distinguish between 1st, 2nd, and 3rd degree burns.
- 1st degree burns
skin is inflamed, red - surface layer of skin is shed
 - 2nd degree burns
deeper injury - blisters form as fluid builds up beneath outer layers of epidermis
 - 3rd degree burns
full thickness of skin is destroyed -sometimes even subcutaneous tissues results in ulcerating wounds

For Questions 105-108, use the pictures (A, B, and C) of skin cancer.

105. Which picture is of Basal cell carcinoma?

B

106. Which picture is of Squamous Cell Carcinoma?

C

107. Which picture is of Melanoma?

A

108. Which of these types of skin cancer is the most deadly? Why?

Malignant Melanoma – it spreads rapidly – often begins in moles



109. Distinguish between irritant and allergic dermatitis.

Irritant dermatitis is the most common type. It's caused by contact with acids, alkaline materials such as soaps and detergents, fabric softeners, solvents, or other chemicals
Allergic dermatitis is caused by exposure to a substance or material to which you have become extra sensitive or allergic.

110. For which type of dermatitis does the reaction usually look like a burn? (Irritant or allergic)

Irritant