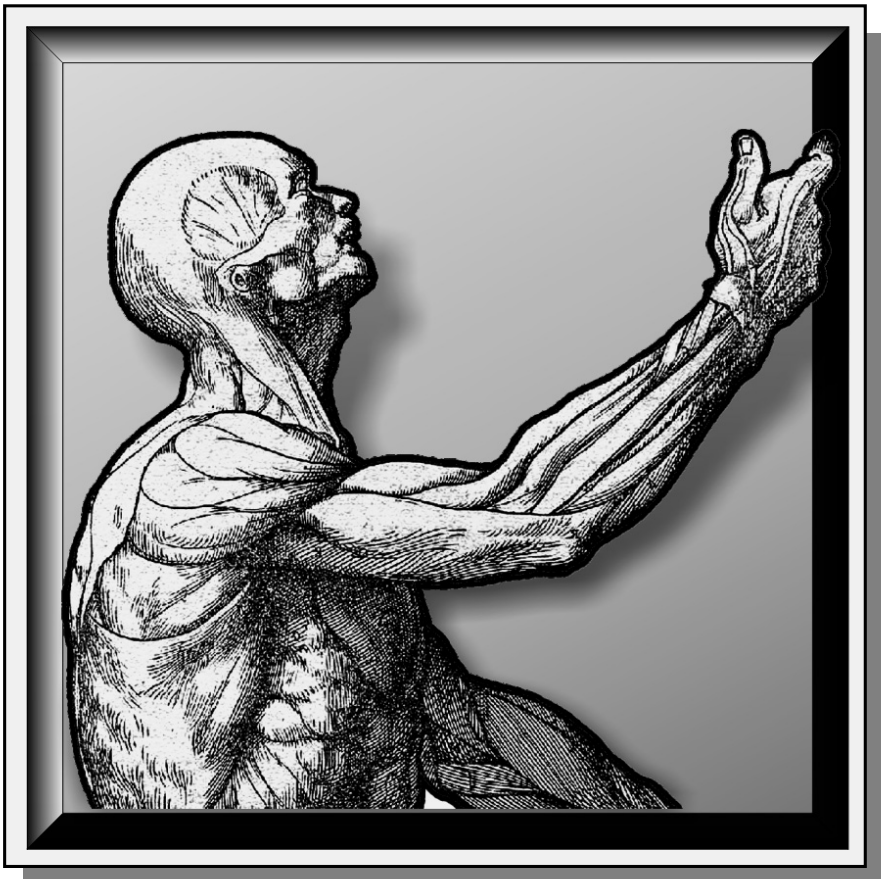
Precepts of Anatomy & Physiology

ACTIVITIES



Chapter 1

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Precepts of Anatomy & Physiology

Chapter 1, Activities

Publishers
Gene Hood, LL.D.
Ronald E. Johnson, C.Ph.D.

Managing Editor
Ronald E. Johnson, C.Ph.D.

Technical Writer
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Editors
Nancy S. Johnson
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Production
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Chapter 1, Section 1



THE HUMAN BODY: ORGANIZATION



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

Matching:

1. _____ Herophilus
2. _____ Galen
3. _____ Vesalius

(a) Greek physician; most famous in the Roman Empire
(b) Flemish physician; used human cadavers in study of anatomy; authored medical illustrated textbook
(c) Greek surgeon; pioneered study of human dissection

4. A ***cadaver*** is a(n) _____ used for ***dissection***.
5. Vesalius taught medical students and authored a detailed book on human anatomy before the age of 30. _____ (a) True or (b) False

6. The human body consists of an estimated 30 to 100 _____ cells, depending on the size of the individual.
   (a) thousand (b) million (c) billion (d) trillion

7. According to the illustration on page two of your text, the basic tasks of each "simple cell" are categorized into approximately _____ basic job descriptions.
   (a) 5 (b) 10 (c) 15 (d) 20

8. The basic structural and functional units of life are called: _____.
   (a) tissues (b) organs (c) cells (d) organ systems

9. A mass of similar cells that performs a specific function is called a(n): _____.
   (a) tissue (b) organ (c) cell (d) organ system

Matching:

10. _____ epithelial tissue
11. _____ connective tissue
12. _____ nerve tissue
13. _____ muscle tissue
14. _____ bone tissue

(a) provides body framework, strength, freedom of movement
(b) covers interior and exterior body surfaces
(c) connects with bones to enable body to move
(d) provides support for the body and connects its parts
(e) transmits nerve impulses throughout the body

15. A group of ***tissues*** that work together to perform a specific function is called a(n): _____
    (a) tissue (b) organ (c) cell (d) organ system

16. The human eye consists of each of the four basic types of tissues. _____
    (a) True or (b) False

17. A group of ***organs*** that perform closely related functions are called: _____
    (a) tissues (b) organs (c) cells (d) organ systems

18. The human eye is part of the _____ system.
(a) circulatory (b) nervous (c) endocrine (d) lymphatic

19. Which of the following is the correct sequence of the levels of organization from least to most complex?_____
(a) cell, tissue, system, organ (c) cell, tissue, organ, system
(b) tissue, cell, system, organ (d) tissue, system, organ, cell

20. The human body consists of _____ ***organ systems***.
(a) 5 (b) 7 (c) 11 (d) 15

Matching: Match each system with its primary function.

21. _____ skeletal and muscular systems
22. _____ nervous system
23. _____ endocrine system
24. _____ digestive and respiratory systems
25. _____ circulatory system
26. _____ excretory system
27. _____ reproductive system
28. _____ integumentary system
29. _____ immune-lymphatic systems

(a) transports nutrients and oxygen-rich blood throughout the body
(b) maintains order among the body's cells
(c) holds body together and protects from invading bacteria
(d) fights off invading germs and provides protection from diseases and parasites
(e) protects inward parts and supports body
(f) rids body of waste
(g) provides raw materials to sustain body functions
(h) produces offspring
(i) interprets and responds to stimuli

30. Name the system that is necessary for the survival of a species. _____
_____

31. List the 3 body systems that function in some form of protection. _____,
_____, _____

32. Write the **Life Principle**: "_____
_____."



THE HUMAN BODY: COMMUNICATION AND CONTROL



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Name the two organ systems that are responsible for maintaining communication within the body: _____, _____.

2. A ***neuron*** that carries impulses throughout the nervous system is a(n): _____.
   (a) target cell (c) hormone
   (b) receptor (d) nerve cell

3. The center of the body's nerve network is the _____, where impulses arrive from every part of the body.

4. The endocrine system is comprised of many glands centrally located in the body._____
   (a) True or (b) False

5. Organs that produce and release chemicals are called _____.

6. A ***hormone*** is a chemical that travels throughout the bloodstream in response to certain stages in life (such as _____), as well as a person's _____ _____ at any given time.

7. Good thoughts produce emotions that trigger _____ hormones and _____ health.

8. _____ thoughts release hormones that _____ physical and emotional health.
   (a) toxic; destabelize (b) good; destabelize (c) toxic; build (d) toxic; maintain

9. Specific chemical binding sites for particular hormones are called axons. _____
   (a) True or (b) False

10. A ***target cell*** is one which has _____ for a specific hormone or other chemical substance.
    (a) neuron (b) receptor (c) somatic cell (d) dendrite

11. The steady-state physiological condition of the body in which chemical conditions are being constantly balanced is called _____.

12. _____ is released in the blood when sugar levels begin to get too high.
    (a) estrogen (c) cortisol (b) insulin (d) glucagon

13. Which hormone would most likely be released after a large meal? _____
(a) estrogen (b) insulin (c) cortisol (d) glucagon

14. _____ converts glycogen to glucose, thereby raising the blood sugar level.
(a) estrogen (c) aldosterone
(b) insulin (d) glucagon

15. Which of the following hormones would be most likely to be released during a period of fasting (not eating)? _____
(a) insulin (b) glucagon (c) aldolsterone (d) estrogen

16. **Review.** Apply what you have learned.
Histamine is a chemical that is released by the body's immune system, causing symptoms such as runny nose and itchy, watery eyes. An antihistamine can be taken to prevent the symptoms of histamine from occurring. An antihistamine is similar to histamine in size, shape and polarity. How does an antihistamine most likely prevent the effects of histamine? _____
_____
(a) It prevents the release of histamine from the immune system.
(b) It increases the production of receptors by target cells.
(c) It binds to histamine receptors on the surfaces of target cells.
(d) It attacks the histamine molecules and destroys them.

17. Write the **Life Principle:** "_____
_____."





THE HUMAN BODY: THE ENDOCRINE SYSTEM— HORMONES AND HOMEOSTATIS

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Hormones are released into the bloodstream by ***glands*** in response to: _____ and _____ stimuli.

2. An organ that prepares and secretes a substance for further use in, or discharge from, the body is called a(n) _____.

3. The ***endocrine system*** is a(n) _____ involving hormones and the ductless glands that secrete the hormones.
   (a) excretory system (c) digestive system
   (b) nervous system (d) chemical communication system

4. Molecular receptors on or in target cells that respond to hormones are not considered to be part of the endocrine system. _____ (a) True or (b) False

5. List any four endocrine glands: _____, _____ _____, _____

6. Endocrine system signals are very accurate and longer lasting than those of the nervous system. _____ (a) True or (b) False

7. Which of the following statements applies to both hormones and nerves? _____
   _____
   (a) They operate differently as children grow into adults.
   (b) They affect only one organ.
   (c) They produce very accurate and long lasting effects.
   (d) They exert control over bodily activities.

8. The three D's that result from a body's chemical imbalance are (in ASCENDING ORDER of severity):
   _____; _____; _____

9. Hormones play a key role in keeping the body: _____.
   (a) healthy (c) ordered
   (b) balanced (d) all of these

10. Claude Bernard, a French _____ developed a clear idea of human chemical balance during the 19th century.
    (a) physicist (c) physiologist
    (b) immunologist (d) microbiologist

11. Bernard observed "constant internal milieu" in which of the following? _____
_____
(a) the hydra's ability to change the temperature of the water surrounding it
(b) the hydra's ability to change its body temperature to match that of the water surrounding it
(c) the hydra's ability to maintain its internal temperature as the temperature of the surrounding water changed
(d) all of the above

12. In 1902, the British physiologist _____ discovered hormones.
(a) Walter Canon (c) Neils Bohr
(b) Ernest Starling (d) Claude Bernard

13. The mechanism of homeostasis is found in _____ of the eleven body systems.
(a) five (c) nine
(b) seven (d) eleven

14. _____ coined the term "homeostasis" in 1932 in his book, *The Wisdom of the Body*.
(a) Walter Canon (c) Neils Bohr
(b) Ernest Starling (d) Claude Bernard

15. Place an "X" before each assertion made by the author of *The Wisdom of the Body*:
_____ Organisms have marvelously interdependent features.
_____ Living organisms appear to be the result of purposeful engineering.
_____ Living organisms appear to be the result of evolutionary processes.
_____ The body operates like an alert community.
_____ The body automatically corrects imbalances.

16. Name two man-made systems that serve as basic illustrations of how homeostatis operates in the body: _____,
_____

17. Write the **Life Principle:** "_____
_____."





THE HUMAN BODY: THE ENDOCRINE SYSTEM— MAJOR ORGANS AND HORMONES

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Place an "X" in front of each of the following that is included in the ***HPA Axis***.
   _____ pituitary gland
   _____ pineal gland
   _____ thyroid gland
   _____ adrenal gland
   _____ thymus
   _____ hypothalamus

2. The nickname, "brain of the brain", refers to the: _____
   (a) HPA axis (b) hypothalamus (c) pituitary gland (d) adrenal glands

3. The _____, a tiny cluster of nerve cells located at the center of the base of the brain, controls most body _____.
   (a) thymus; immune functions (c) hypothalamus; hormones
   (b) pancreas; digestive processes (d) pineal gland; growth processes

4. The _____ is the main gland of the ***limbic system*** and links the nervous and endocrine systems

5. The hypothalamus releases powerful _____, based on your thought life.

6. Thoughts that trigger emotions and hormones materialize in the body both _____ and _____.

7. Bitter, hateful, fearful thoughts will eventually result in poor health and emotional misery.
   _____ (a) True or (b) False

8. Which of the following processes is regulated by the hypothalamus? _____
   _____ (a) body temperature (b) hunger (c) sleep (d) all of these

9. Which "master gland" is regulated by the hypothalamus? _____
   (a) parathyroid (b) adrenal (c) pituitary (d) pineal

10. Which of the following glands acts as the headquarters for the nervous and endocrine systems, coordinating their functions? _____
    (a) thymus (b) pineal gland (c) pancreas (d) pituitary gland

11. The adrenal glands are located: _____.
    (a) on a tiny stalk at the base of the brain
    (b) at the center of the base of the brain
    (c) over the top of each kidney
    (d) in the mesenteries of the digestive tract

12. The adrenal gland produces which two hormones that are released in response to fear or anger? _____, _____

13. The reaction that may result from the release of large amounts of adrenal hormones such as ***adrenaline*** (also called _____) in response to fear or anger is called the _____ reaction.

14. Place an "X" in front of each of the following that are caused by an adrenal hormone rush.
    _____ increased heart rate
    _____ blood shunted to digestive tract
    _____ rise in blood pressure
    _____ constricted eye pupils
    _____ blood shunted to skeletal muscles

15. _____ suppresses inflammation and regulates conversion of carbohydrates into glucose.
    (a) thyroxin (b) epinephrine (c) cortisol (d) aldosterone

16. _____ prevents excessive loss of water through the kidneys and maintains the balance between sodium and potassium in the blood.
    (a) thyroxin (b) epinephrine (c) cortisol (d) aldosterone

17. Which of the following are necessary in the production of ***thyroxin*** by the thyroid gland?
    _____
    (a) iodine and tyrosine (c) iodine and guanine
    (b) iodine and adenine (d) iodine and cytosine

18. Thyroxin _____ the metabolic rate of nearly all the cells of the body and increases the rate of cell growth.
    (a) increases (b) decreases (c) maintains

19. When levels of thyroxin drop, some cells of the _____ increase their activity.
    (a) adrenal glands (c) pancreas
    (b) pituitary gland (d) hypothalamus

20. _____ targets cells of the thyroid gland, causing it to release more thyroxin.
    (a) ADH (b) TRH (c) CRH (d) TSH

21. A hormonal regulatory system that enables conditions within the body to remain constant is called: _____
    (a) negative feedback (c) homeostasis
    (b) positive feedback (d) feedback regulation

22. The relationship between the thyroid gland and hypothalamus is an example of _____.

Use the chart on page 15 of your text to answer questions #23-30.

23. Which of the following hormones is released from the pituitary gland? _____
    (a) calcitonin (c) aldosterone
    (b) estrogen (d) luteinizing hormone

24. Damage to the pancreas could result in which of the following? _____
    (a) difficulty in the reabsorption of water (c) difficulty controlling blood glucose
    (b) stunted growth in adolescents (d) low tolerance for stress

25. Place an "X" in front of each of the following hormones that influence sex characteristics and reproductive function.
    _____ (a) calcitonin _____ (e) prolactin
    _____ (b) ADH _____ (f) glucagon
    _____ (c) FSH _____ (g) estrogen
    _____ (d) LH _____ (h) testosterone

26. Which of the following hormones would be necessary for parturition (birth of a baby)? _____
    (a) PTH (b) cortisol (c) oxytocin (d) testosterone

27. Which of the following hormones have an antagonistic relationship? _____
    (a) calcitonin and PTH (c) TSH and thyroxine
    (b) oxytocin and prolactin (d) LH and testosterone

28. Which of the following hormones is released from the thyroid gland?
    (a) cortisol (b) prolactin (c) calcitonin (d) oxytocin

29. Damage to the ovary could result in which of the following?_____
    _____
    (a) difficulty in the reabsorption of water
    (b) difficulty in conception and maintenance of pregnancy
    (c) low tolerance for stress
    (d) stunted growth in adolescents

30. Which of the following hormones would be necessary for the mobilization of calcium stores? _____
    (a) thyroxine (b) calcitonin (c) PTH (d) ADH

31. Write the **Life Principle**: "_____
    _____."





THE HUMAN BODY: THE ENDOCRINE SYSTEM— THE PANCREAS

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The pancreas is: _____.
   (a) an endocrine gland (c) both an endocrine and an exocrine gland
   (b) an exocrine gland (d) neither an endocrine nor an exocrine gland

2. Glands such as sweat and salivary glands that excrete their products into tubes or ducts that do not empty into the bloodstream are called _____ glands.

Label #3-4 as either "endocrine" or "exocrine" functions.

3. _____ functions produce digestive juices and release them through the pancreatic duct into the intestine.

4. _____ functions control the amount of sugar in the blood.

5. The microscopic lumps of cells scattered throughout the pancreatic tissue that ultimately control blood sugar levels are called: _____.
   (a) crypts of Leiberkuhn (c) alpha cells
   (b) islets of Langerhans (d) beta cells

6. _____ produce the hormone ***glucagon***.
   (a) beta cells (b) gamma cells (c) alpha cells (d) epsilon cells

7. _____ produce the hormone ***insulin***.
   (a) beta cells (b) gamma cells (c) alpha cells (d) epsilon cells

8. _____ and _____ constitute a hormanal check-and-balance system for blood sugar levels.

9. Which hormone causes ***glycogen*** to be broken down into glucose, thus raising the blood glucose level? _____

10. Which hormone lowers blood ***glucose*** by promoting the uptake of glucose by most body cells and by promoting the synthesis and storage of glycogen in the liver? _____

11. Insulin release is stimulated by: _____.
    (a) high blood glucose levels (c) low blood glucose levels
    (b) high liver glycogen levels (d) high muscle protein levels

12. Without insulin, no glucose can get into muscle cells to be used for energy. _____
    (a) True or (b) False

13. When blood levels of glucose increase dramatically to levels high above normal, glucose begins to spill into the _____.

14. The disorder of the endocrine system in which the pancreas secretes too little insulin causing an excess of glucose in the bloodstream is called: _____.
    (a) hypoglycemia (c) pernicious anemia
    (b) diabetes mellitus (d) hemophilia

15. Place a "J" or "A" before each statement below to indicate Type I (Juvenile) or Type II (Adult-onset) typical diabetes characteristics.
    _____ usually occurs before age 20
    _____ slow-healing cuts and bruises, blurred vision
    _____ requires daily insulin injection
    _____ usually affects people over age 40
    _____ a genetically inherited condition
    _____ constitutes about 10% of diabetics
    _____ 90% of the time is a consequence of obesity
    _____ promotes extreme thirst and hunger
    _____ tingling or numbness or extremeties (hands, feet)
    _____ can normally be treated with diet and exercise rather than insulin

16. Some symptoms or characteristics of diabetes can pertain to either Type I or Type II _____
    (a) True or (b) False

17. In the experiment described in your text, what substance was contained in the urine of dogs without a pancreas that was absent in dogs with a pancreas ? _____
    (a) salt (b) sugar (c) vitamins (d) acids

18. Which of the following would most likely stimulate the release of glucagon from the pancreas? _____
    (a) digestion of a large meal (b) a three day fast (c) neither of these

19. Glucagon's primary organ target is the: _____.
    (a) stomach (b) liver (c) heart (d) kidney

20. The adrenal glands secrete _____, which regulates the conversion of carbohydrates into glucose.

21. Write the **Life Principle**: "_____
    _____."

Note: Ask your teacher for the quiz over topics 1 - 5 before proceeding to the next section. Reminder:If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!





THE HUMAN BODY: THE NERVOUS SYSTEM— INTRODUCTION

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A cell consisting of a cell body, dendrites and an axon that carries impulses throughout the nervous system, is called a(n): _____.
   (a) schwann cell (c) neuron
   (b) neurotransmitter (d) target cell

2. An electrical signal carried by neurons in the nervous system is called a(n): _____
   (a) neurotransmitter (c) action potential
   (b) myelin sheath (d) impulse

Matching:

3. _____ ***cell body*** (a) long, branched extension that carries impulses away from the cell body
4. _____ ***dendrite*** (b) largest part of the neuron in which metabolic activity takes place
5. _____ ***axon*** (c) small, branched extension that carries impulses toward the cell body

6. A neuron may have many axons, but it usually has only one dendrite. _____
   (a) True or (b) False

7. In the human body, neurons are clustered into bundles of fibers called _____.

8. At rest, the inside of a neuron is _____ charged and the outside is _____ charged.
   (a) positively; negatively (c) negatively; positively
   (b) positively; positively (d) negatively; negatively

9. The difference in electric charges when a neuron is at rest is called the _____.

10. When an ***impulse*** begins in a neuron, positive ions rush across the cell membrane, causing the inside of the membrane to be more _____ than the outside.
    (a) positive (b) negative (c) neutral (d) homeostatic

11. The rapid change in voltage on the inside of the axon from negative to positive and then back to negative is called an ***action potential***. _____ (a) True or (b) False

12. The chain of supporting cells enclosing the axons of many neurons and forming an insulating layer are called: _____.
    (a) Alpha cells (b) Goblet cells (c) Schwann cells (d) Chief cells

13. The insulating substance that surrounds many vertebrate nerve cells is called the _____.

14. The gaps formed by the supporting cells enclosing an axon are called ***synapses***. _____
(a) True or (b) False

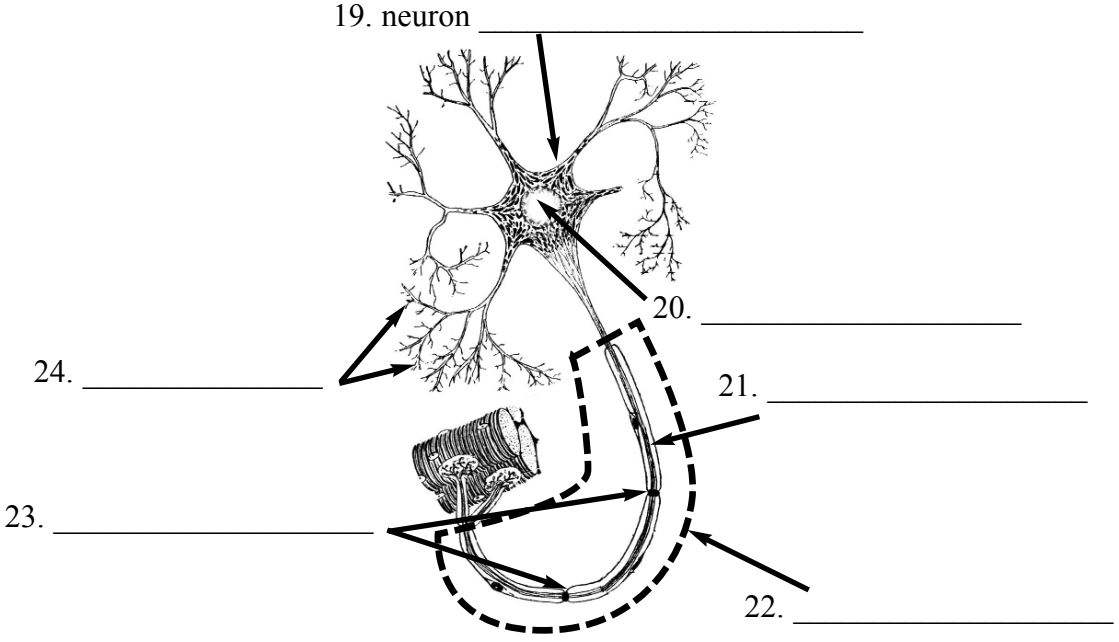
15. Impulses travel along myelinated axons _____ than (as) they travel along axons that are not myelinated.
(a) faster (b) slower (c) at the same speed

16. The point where an impulse is transmitted from one nerve cell to the next is called the _____.

17. Place an "X" in front of each accurate statement about neurons, synapses and dendrites.
_____ Each neuron is in some way connected to thousands of other neurons.
_____ Neuron links can result in multiplied millions of linking pathways.
_____ The way a person thinks can impact the quantity of linkages
_____ Positive thoughts engender extensive dendrite branching and better health.
_____ Negative thoughts have little bearing on dendrite branching and status of health.
_____ Most illnesses directly or indirectly are attributable to toxic thought patterns and emotions.

18. ***Neurotransmitters*** are chemicals that: _____.
(a) are released when an action potential reaches the end of an axon
(b) attach to receptors on the second neuron in a synapse
(c) are broken down by enzymes or recycled by an axon
(d) all of the above

Label the nerve cell figure below for questions #19-24.



25. Write the **Life Principle**:
"_____
_____."





THE HUMAN BODY: THE NERVOUS SYSTEM— ORGANIZATION

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The left side of the brain controls the right side of the body and the right side of the brain controls the left side of the body. _____ (a) True or (b) False

2. The ability of the brain to make long-term adjustments to long-term changes is called: _____.
   (a) elasticity (b) plasticity (c) motility (d) resilience

3. A cell of the nervous system that provides support, insulation and protection for neurons is called a(n): _____.
   (a) sertoli cell (b) goblet cell (c) beta cell (d) glial cell

4. There are approximately _____ neural connections in the human body.
   (a) 10^{10} (b) 10^{12} (c) 10^{14} (d) 10^{16}

5. Name the two major divisions of the nervous system: _____ _____, _____.

6. The central nervous system consists of the _____ and _____.

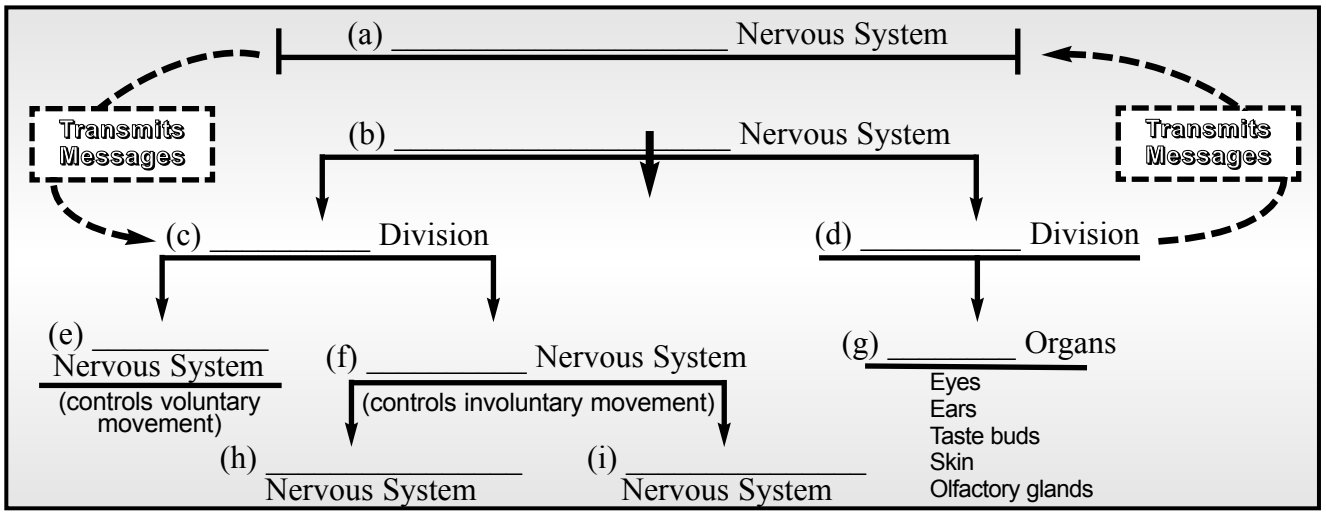
7. Which of the following statements does NOT apply to both organs of the central nervous system? _____
   (a) They are protected by the skeletal system.
   (b) They are cushioned by meninges.
   (c) They are surrounded by cerebrospinal fluid.
   (d) They are guarded by the periferal nervous system.

8. The peripheral nervous system includes all the nerves and associated cells that connect the brain and spinal cord to the rest of the body. _____ (a) True or (b) False

9. The sensory division of the peripheral nervous system carries information from the _____ to the _____.
   (a) central nervous system; rest of the body (c) sense organs; rest of the body
   (b) sense organs; central nervous system (d) rest of the body; sense organs

10. The motor division of the _____ nervous system receives information from the _____ and transmits it to ***sonomic*** and ***autonomic nervous systems***.

11. **Label the various parts of the nervous system on the chart below.**



12. The part of the motor division of the peripheral nervous system that controls voluntary movements is called the: _____.
    (a) central nervous system (c) somatic nervous system
    (b) sensory nervous system (d) autonomic nervous system

13. The part of the motor division of the peripheral nervous system that regulates activities **NOT** under conscious control is called the: _____.
    (a) central nervous system (c) somatic nervous system
    (b) sensory nervous system (d) autonomic nervous system

14. The sympathetic and the parasympathetic nervous systems are immediate subdivisions of the: _____.
    (a) central nervous system (c) somatic nervous system
    (b) sensory nervous system (d) autonomic nervous system

15. The _____ and the _____ nervous systems work by opposite means to maintain balance in body organs and other body systems.

Each of the following body functions is controlled by either the somatic or autonomic nervous system. Label each accordingly.

16. _____ turning the pages of a book
17. _____ the knee-jerk reflex
18. _____ beating of the heart
19. _____ kidney filtration
20. _____ writing with a pencil
21. Write the **Life Principle:** _____ _____."



THE HUMAN BODY: THE NERVOUS SYSTEM— THE BRAIN



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The primary components of the nervous system is/are the: _____.
   (a) brain (c) peripheral nerves
   (b) spinal cord (d) sensory receptors

2. The brain weighs an average of _____ pounds.
   (a) 8 (b) 4 (c) 3 (d) 2

3. The brain may use as much as _____ percent of the body's energy.
   (a) 15 (b) 25 (c) 55 (d) 75

4. In the event of blood loss, the body will direct blood flow away from the brain and toward more vital organs. _____ (a) True or (b) False

5. According to Isaac Asminov, the human brain is ... "the most _____ and orderly arrangement of matter in the _____."

6. Only man's brain can prompt him to ask the four basic questions in life, which are:
   _____?
   _____?
   _____?
   _____?

7. A brain cell only has the capacity to connect to two other cells at one time. _____
   (a) True or (b) False

8. A man-made supercomputer is an adequate comparison to the capabilities of the human brain._____ (a) True or (b) False

9. The most logical conclusion pertaining to the illustrative similarities between a walnut and the human brain would be that: _____
   _____
   (a) The brain probably evolved from an early ancestor of the walnut.
   (b) The walnut probably evolved from the dormant brain of an early ape-man.
   (c) The walnut and the human brain are somehow related.
   (d) The walnut and the human brain show similar surface design.

Matching overview:

10. _____ ***cerebrum***
11. _____ ***corpus callosum***
12. _____ ***hippocampus***
13. _____ ***cerebral cortex***
14. _____ ***cerebellum***
15. _____ ***brainstem***
16. _____ ***medulla oblongata***
17. _____ ***pons***
18. _____ ***thalamus***

(a) second-largest part of the brain at lower back of head
(b) deeply creased surface of the cerebrum
(c) regulates the information that goes to the cerebral cortex
(d) part of brainstem that regulates flow of information between the brain and the rest of the body
(e) largest, most complex part of the human brain; has 4 lobes
(f) region of connecting tissue at the base of the brainstem
(g) connects brain to the spinal cord
(h) c-shaped, thick band of nerve fibers connecting the right and left cerebral hemispheres
(i) short memory-holding tank; free-will component of brain

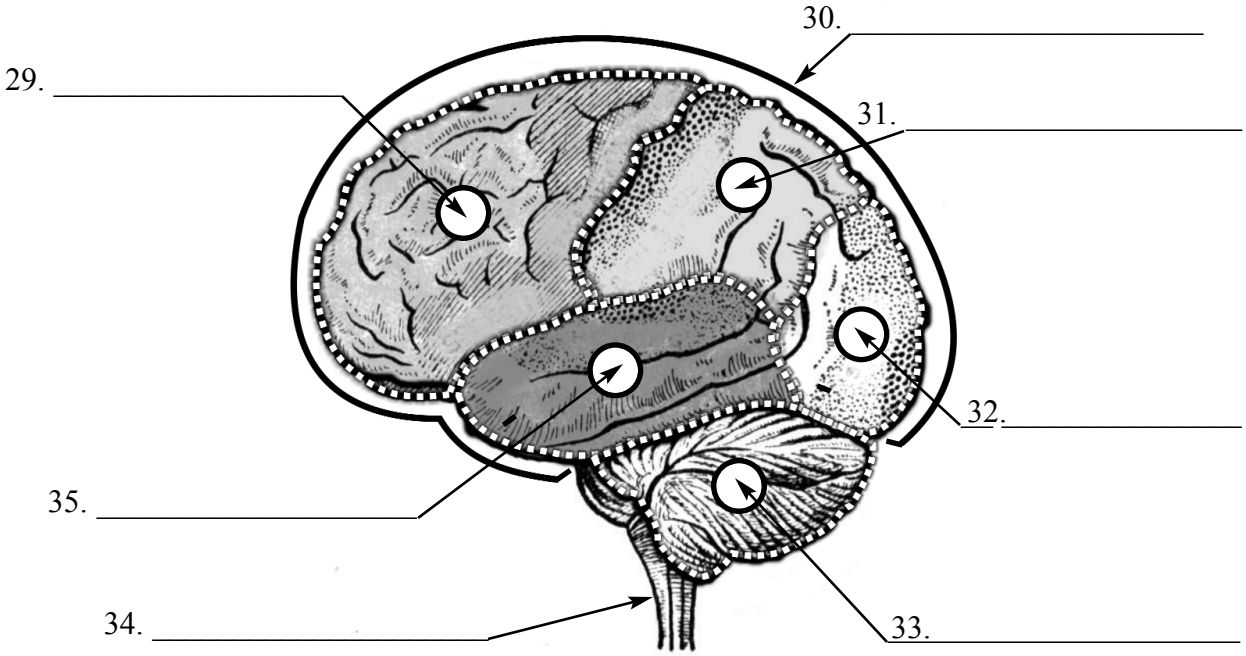
Which part of the brain controls each of the following processes? Use the WORD BANK to answer questions #19-26. One word will be used twice.

WORD BANK

left hemisphere cerebrum cerebral cortex cerebellum
brainstem thalamus right hemisphere

19. _____ learning, judgement, intelligence
20. _____ controls right side of body
21. _____ controls left side of body
22. _____ information processing, body movement control
23. _____ balance and coordination of muscle action
24. _____ blood pressure, heart rate, breathing, swallowing
25. _____ regulation of information to cerebral cortex
26. An individual that recently had an accident involving trauma to the head is now unable to survive without the assistance of machines to perform basic, involuntary life processes. The individual had likely experienced damage to which part of the brain?
_____
27. Broca's area of the brain controls which of the following processes? _____
(a) learning (b) hearing (c) speaking (d) breathing
28. The frontal, parietal and occipital lobes are divisions of which part of the brain?
_____
(a) cerebrum (b) cerebellum (c) brainstem (d) temporal lobe

Label the major brain divisions in the figure below for questions #29-35.



36. Write the **Life Principle**: "_____
_____."





THE HUMAN BODY: THE NERVOUS SYSTEM— THE EYES

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. List the five human senses: _____, _____, _____, _____, _____.

2. Approximately _____ percent of everything we know reaches the brain through our eyes.
   (a) 20 (b) 40 (c) 60 (d) 80

3. The eyes receive information from _____ rays.

4. Objects that absorb all light rays appear to be _____, whereas those that reflect all the light rays appear to be _____.
   (a) black; white (b) white; black (c) white; white (d) black; black

Matching:

5. _____ ***cornea***
6. _____ ***iris***
7. _____ ***pupil***
8. _____ ***lens***
9. _____ ***vitreous humor***
10. _____ ***rods***
11. _____ ***cones***

(a) opening in the iris that regulates the amount of light that enters the eye
(b) flexible structure behind the pupil, filled with a transparent protein that helps adjust eyes to focus to see hear or far objects
(c) tough transparent layer at the surface of the eye that focuses light
(d) transparent fluid that fills the large chamber behind the lens
(e) photoreceptor cells in the back of the eye that detect color, but are not very sensitive to light
(f) disk of tissue located at the back of the cornea
(g) photoreceptor cells in back of eye that are extremely sensitive to light, but do not detect color

12. Visual information is relayed from rods and cones to the brain through the _____.
   (a) auditory nerve (b) olfactory nerve (c) optic nerve (d) facial nerve

13. The area at the back of the eyeball where the optic nerve leads off to the brain is called the "_____".

14. This condition results from there being no _____ or _____ in that area.

15. The "_____" (fovea) at the back of the retina affords the best sight due to a heavy concentration of _____.

16. Place an "X" before each phrase that accurately describes the retina.
    _____ compares to film in a camera
    _____ contains 100,000,000 optic cells
    _____ thinner than plastic wrap
    _____ compares to supercomputers
    _____ can house 200,000 photoreceptor cells per millimeter of space

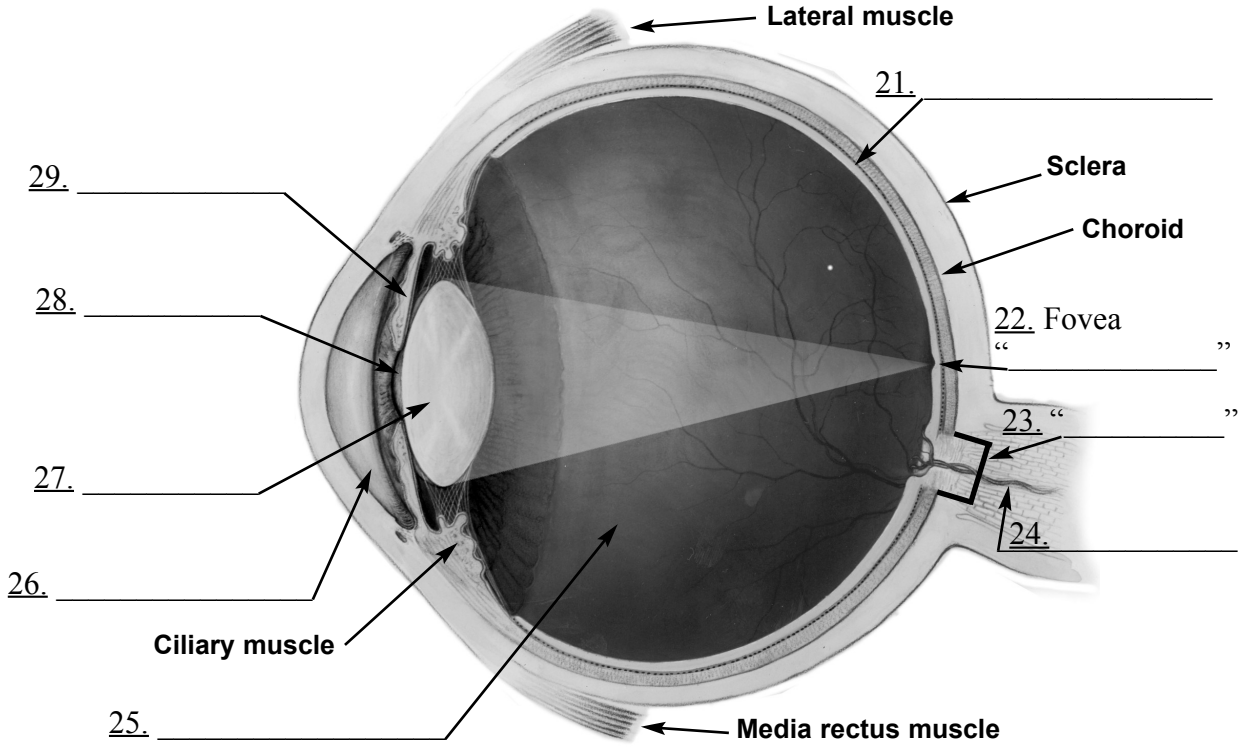
17. Photoreceptor cells have a very high metabolism and must completely replace themselves about every seven days. _____ (a) True or (b) False

18. Eye doctors are technically called _____.

19. The efficiency of the retina far exceeds the best computer chip that man can design. ____
    (a) True or (b) False

20. Charles Darwin described the formation of the eye by natural selection as _____
    _____.
    (a) an obvious conclusion (c) absurd in the highest degree
    (b) a distinct possibility (d) proof of evolution

Label the eye components in the figure below for questions #21-29.



30. Write the **Life Principle:** "_____
    _____."



THE HUMAN BODY: THE NERVOUS SYSTEM— THE SENSES



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Hearing is considered our most important sense. _____ (a) True or (b) False

2. Deep, low-pitched sounds are produced by _____ vibrations in the air.
   (a) fast (b) slow (c) positive (d) negative

3. Noise or sound intensity is measured in _____.

4. Noise-induced hearing loss occurs when the sounds frequently entering unprotected ears exceed _____decibels.

5. Noise that causes pain as well as hearing loss begins at about _____ decibels.

6. Sound waves are first trapped by the auricle. _____ (a) True or (b) False

7. The region of the ear where vibrations enter is called the: _____.
   (a) auditory canal (c) cochlea
   (b) tympanum (d) semicircular canal

8. The ***tympanum*** is the scientific name for the _____.

9. What is the correct progression of the ossicles bones of the ear beginning at the tympanum? _____
   (a) anvil, hammer, stirrup (c) hammer, anvil, stirrup
   (b) stirrup, anvil, hammer (d) stirrup, hammer, anvil

10. Which of the following bones does **NOT** pick up vibrations in the ear? _____
    (a) hammer (c) anvil (b) fibula (d) stirrup

11. The thin membrane covering the opening to the inner ear that picks up the vibrations from the bones of the ear is called the: _____.
    (a) tympanum (c) oval window
    (b) cochlea (d) none of these

12. The fluid-filled portion of the inner ear that creates pressure waves is called the _____.

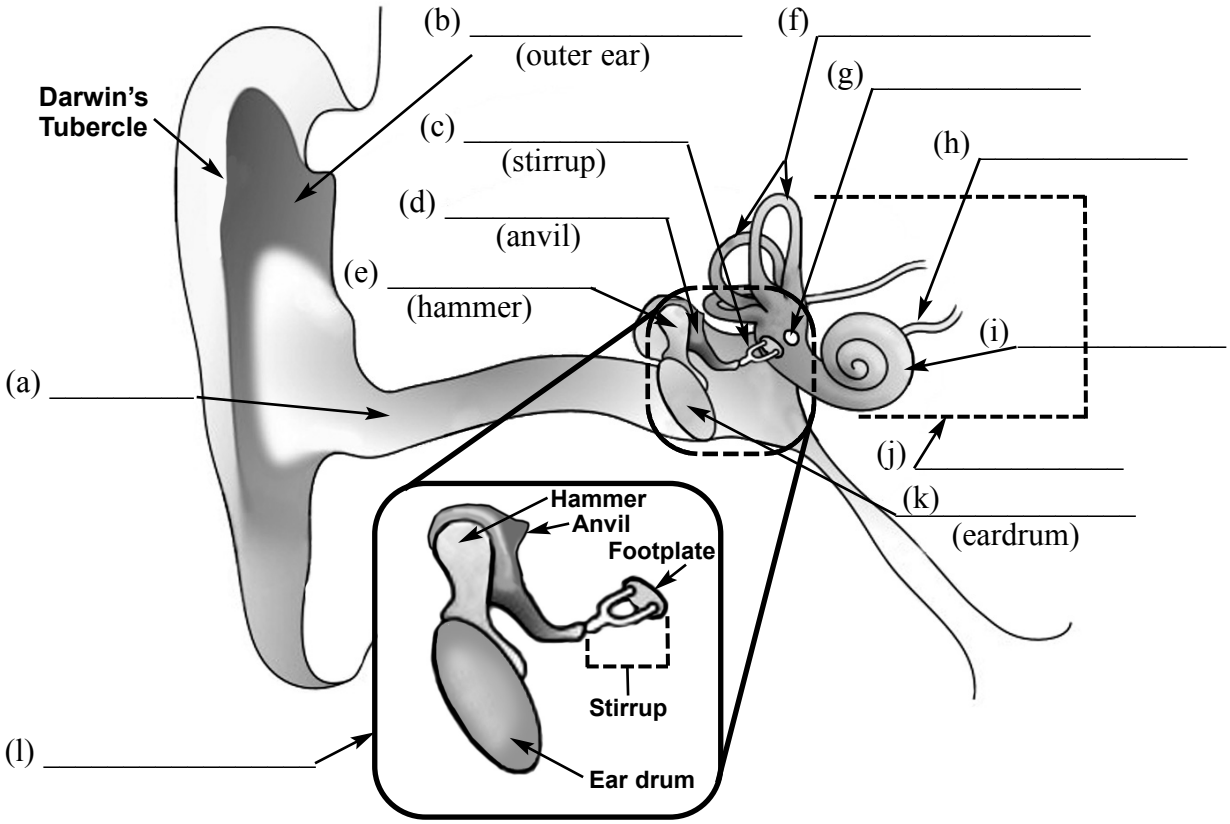
13. ***Hair cells*** lining the ***organ of Corti*** in the ***cochlea*** produce nerve impulses that are sent to the brain through the: _____.
    (a) auditory nerve (c) olfactory nerve
    (b) trigeminal nerve (d) optic nerve

14. The _____ enable(s) the nervous system to sense changes in the position of the head.
(a) cochlea (c) semicircular canals
(b) eustachian tubes (d) auditory canals

15. The downward pressure produced by tiny grains of _____ in the ear enables an individual to sense the pull of gravity.

16. Sufferers of vertigo feel dizzy and disoriented in certain situations, such as when they are on a roller coaster. This is probably related to the individual's: _____ _____.
(a) auditory canal (c) cochlea
(b) semicircular canal (d) tympanum

17. **Label the parts of the ear below. Use the correct scientific terms.**



18. Damage to an individual's sense of smell will have little or no effect on his or her ability to taste. _____ (a) True or (b) False

19. Special cells called *olfactory neurons* in the upper part of the nasal passageway act as _____ for a variety of chemicals.

20. Each person has his/her own genetically designed _____ preferences.

21. Which of the following is **NOT** a specific type of taste receptor found on the human tongue? _____
(a) sweet (b) spicy (c) salty (d) bitter (e) sour

22. The largest sense organ in your body is your _____.

23. Which of the following body parts would be the **LEAST** sensitive to touch? _____
(a) nose (b) lips (c) toes (d) fingers

24. The sensation of _____ is tied to an elaborate network of sensors that report degrees of pressure, touch, heat and cold.

25. The main difference between touch and pain is exerted _____ intensity.

26. Leprosy, also known as _____, involves loss of _____ sensation.

27. Write the **Life Principle**: "_____ _____."

Note: Ask your teacher for the quiz over topics 6 - 10 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!


PAC
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THE HUMAN BODY: THE INTEGUMENTARY SYSTEM



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Which of the following is **NOT** included in the integumentary system? _____
   (a) skin (b) eyes (c) hair (d) nails

2. Three unique characteristics of skin are that it is _____, _____, and _____

3. How does skin compare to the brain? _____
   _____

4. The ***epidermis*** is the outer layer of skin made up of layers of epithelial cells, while the ***dermis*** makes up the inner layers. _____ (a) True or (b) False

5. The epidermis contains about _____ epithelial cells per square centimeter.

6. The tough, flexible structural protein found in hair, fingernails and epidermis is called: _____.
   (a) melanin (b) chitin (c) keratin (d) gelatin

7. Epidermal cells that produce pigments found in the epidermis are called _____.

8. The dark-brown pigment that gives skin its color is called: _____.
   (a) melanin (b) chitin (c) keratin (d) gelatin

9. People with darker skin have more ***melanocyte*** cells. _____
   (a) True or (b) False

10. The inner layer of skin that supports the epidermis and contains nerve endings, blood vessels, smooth muscle and glands is called the _____.

11. Blood vessels in the dermis _____ when the body needs to conserve heat.
    (a) expand (b) constrict (c) shut down (d) none of these

12. On a hot summer day, a bicycle rider sweats and then feels thirsty as his body temperature increases. This response would be an example of: _____.
    (a) increasing respiration (c) blood vessel constriction
    (b) maintaining homeostasis (d) decreasing digestion

13. Both sweat and sebaceous glands are controlled by the _____ system.
    (a) endocrine (b) integumentary (c) nervous (d) muscular

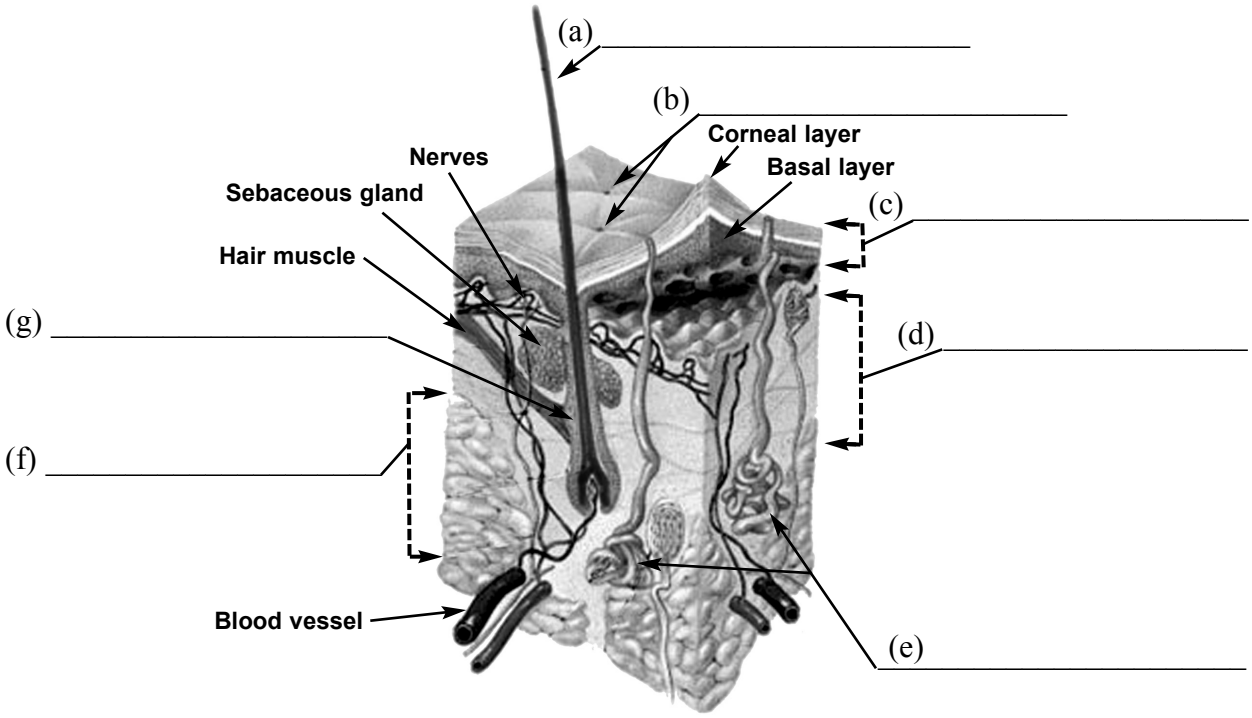
14. Sebaceous glands produce _____ that helps to keep the epidermis flexible and waterproof.
(a) ammonia (b) salt (c) oil (d) acids

15. Hair is produced from columns of cells that are filled with melanin and then die. _____
(a) True or (b) False

16. Toenails and fingernails function mainly in the area of: _____.
(a) protection (b) regulation (c) maintenance (d) support

Review question. Use your text and the figure below to answer questions #17-19.

17. Label the components of human skin in the diagram below.



18. Place an "X" in front of each of the following systems that are represented in this figure.
_____ (a) muscular system
_____ (b) integumentary system
_____ (c) skeletal system
_____ (d) circulatory system
_____ (e) nervous system
_____ (f) reproductive system

19. Which of the following glands is connected to the hair follicle? _____
(a) sebaceous (b) sweat (c) salivary (d) mucous

20. Write the **Life Principle:** _____
_____."





THE HUMAN BODY: THE SKELETAL SYSTEM— PART I

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. One of the main skeletal systems is the ***axial skeleton*** with _____ bones.
2. The axial skeletal system is comprised of the _____, _____, _____, and _____ bones.
3. The ***appendicular skeleton*** is composed of _____ bones including arms and legs, collar bone, _____ and _____.
4. How many bones compose the adult human skeleton? _____
   (a) 123 (b) 236 (c) 143 (d) 206
5. Over half of the bones in the body are in the hands and feet. _____
   (a) True or (b) False
6. The only bone in the human body that is not directly connected to another bone, anchors the tongue and is attached to the skull by ligaments is the: _____.
   (a) sternum bone (c) hyoid bone
   (b) clavicle bone (d) coccyx bone
7. Which of the following is a function of the skeletal system of humans? _____
   (a) support (b) structure (c) protection (d) all of these
8. Bone marrow is responsible for producing _____ cells.
   (a) nerve (b) skin (c) blood (d) muscle
9. Bones store _____ and phosphorus that the body can use when needed.
   (a) glycogen (b) myglobin (c) calcium (d) nitrogen
10. Bones play a role in detoxifying the body. _____ (a) True or (b) False
11. Long bones in the body function as _____, while flat bones serve as _____.
    (a) shields; cubes (b) levers; shields (c) pulleys; levers (d) cubes; shields
12. The body's longest bone is the: _____.
    (a) humerus (b) tibia (c) femur (d) clavicle

Matching:

13. _____ ***perisoteum***
14. _____ ***compact bone***
15. _____ ***Haversian canals***
16. _____ ***spongy bone***
17. _____ ***osteocytes***
18. _____ ***red bone marrow***
19. _____ ***yellow bone marrow***

(a) resilient, supportive bone tissue with an interlaced pattern that withstands stress
(b) tough membrane that surrounds bone
(c) blood forming tissue that produces red and white blood cells
(d) help to build and maintain bones
(e) dense layer of hard bone with spaces for nutrient blood vessels
(f) tissue that contains blood vessels, nerves and fat
(g) small channels in compact bone through which nerve and blood vessels run

20. _____ plays an important role in the body's immune response.
(a) red bone marrow (c) yellow bone marrow
(b) white bone marrow (d) spongy bone

21. Bone begins as _____ and is gradually replaced with bone.

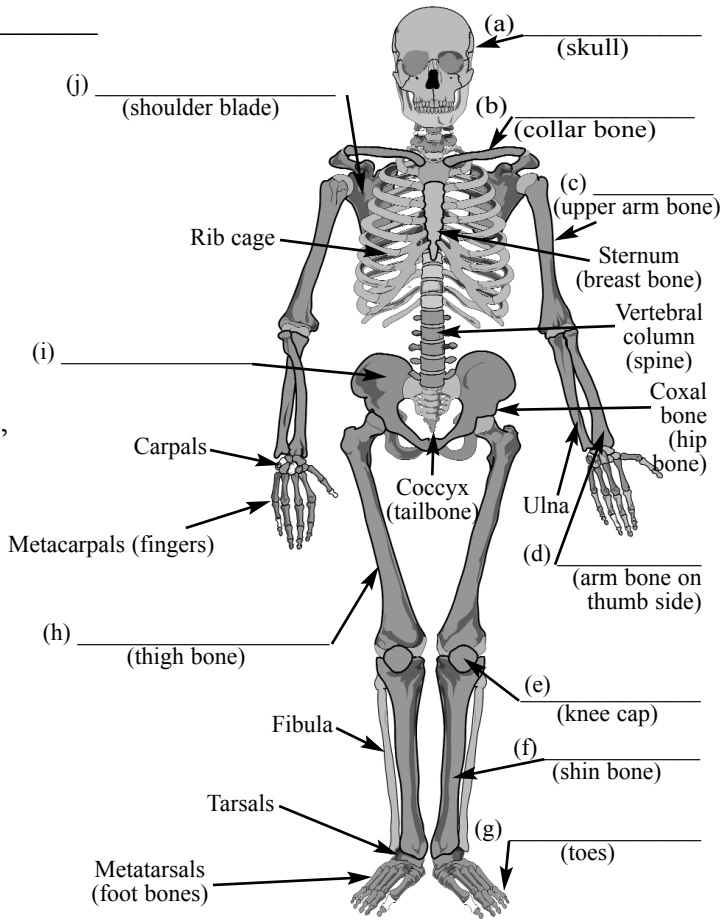
22. The points of growth at either end of long bones are called _____.

23. Which of the following glands instructs bones to stop growing? _____
(a) pineal gland (b) hypothalamus (b) pituitary gland (c) adrenal gland

24. In adults, new bone is constantly forming while old bone is being torn down and reabsorbed. _____
(a) True or (b) False

25. Label the indicated skeletal parts in the figure to the right. Use the correct scientific terms.

26. Write the **Life Principle**:
"_____
_____
_____
_____
_____."





THE HUMAN BODY: THE SKELETAL SYSTEM— PART II



You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The region where two bones meet is known as a(n): _____.
   (a) synapse (b) joint (c) terminal (d) all of these

2. ***Fixed joints*** allow _____ between bones.
   (a) wide range of movement (c) small amount of movement
   (b) little or no movement (d) none of these

3. The "soft spot" on a baby's head does not fully close until about age _____.

4. ***Slightly movable joints*** allow _____ between bones.
   (a) a wide range of movement (c) a small amount of movement
   (b) little or no movement (d) none of these

5. The _____ and _____ constitute slightly moveable joints.

6. The strong, resilient connective tissue that separates the bones of the spinal column is called _____.

7. ***Freely movable joints*** allow _____ between bones.
   (a) a wide range of movement (c) a small amount of movement
   (b) little or no movement (d) none of these

8. The ball-and-socket joints of the _____ and _____ provide the widest range of motion.

9. A band of tissue that connects the bones of a joint is called a(n): _____.
   (a) tendon (b) ligament (c) muscle (d) suture

10. A cord of tissue that connects muscles to bones is called a(n): _____.
    (a) tendon (b) ligament (c) muscle (d) suture

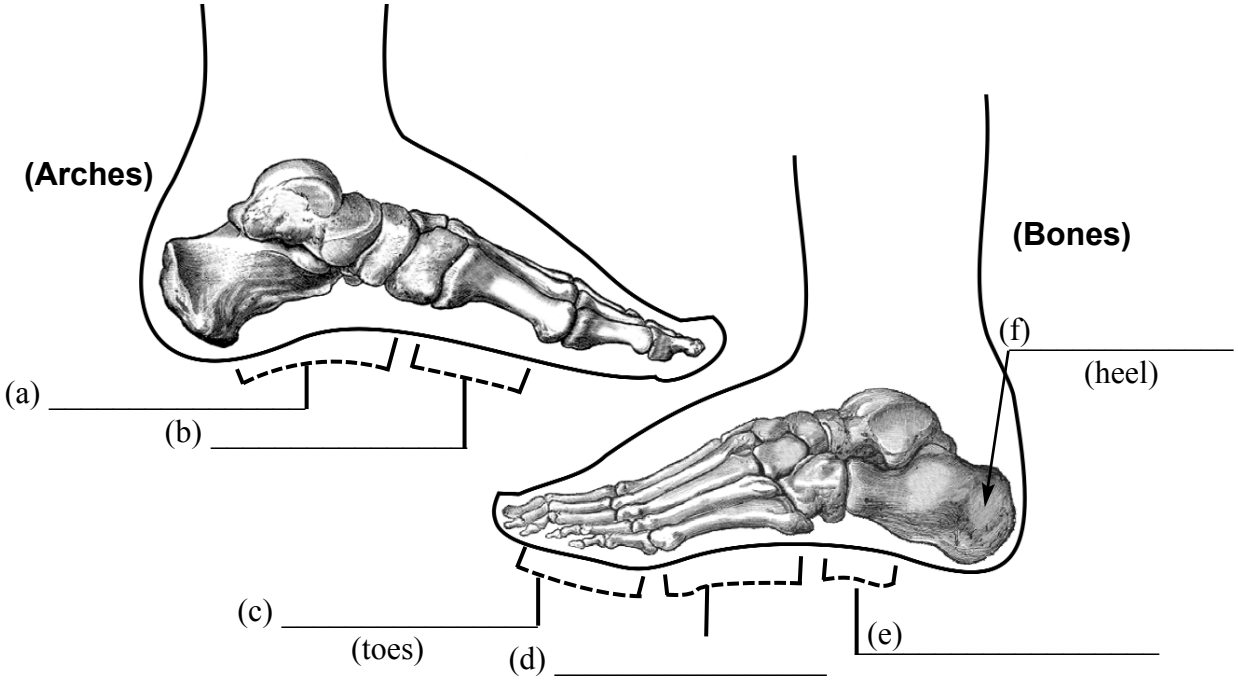
11. A lubricant found in a joint that reduces friction and allows bones to readily slip over each other is called: _____.
    (a) interstitial fluid (c) cerebrospinal fluid
    (b) synovial fluid (d) vitreous fluid

12. The human foot consists of _____ separate bones, and is fully formed by age _____.
    (a) 21;10 (b) 24;18 (c) 26;15 (d) 30;12

13. The foot has two _____ that support the weight of the body and provide leverage when walking (an average of _____ miles in a normal lifespan).

14. The structure of the foot has been compared to the engineering of feat of a _____ _____.

15. Label the arches and major foot bones as indicated below.



16. The skull contains _____ bones, including the _____..

17. Dr. Jack Cuozzo's studies suggest that the human head does not stop growing as it ages. _____ (a) True or (b) False

18. Dr. Cuozzo concluded that the Neanderthal man was a human ancestor. _____ (a) True or (b) False

Review. Label questions # 19-24 as fixed, slightly moveable, or freely moveable joints.

19. _____ shoulder

20. _____ rib

21. _____ hip

22. _____ skull

23. _____ elbow

24. _____ spinal column

25. Write the **Life Principle**: "_____ _____."





HUMAN BODY: THE MUSCULAR SYSTEM— PART I

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The major ***muscles*** of the body number over 600 and constitute approximately _____ percent of the total body weight.
   (a) 20-30 (b) 30-40 (c) 40-50 (d) 50-60

2. The largest muscle in the body is the: _____.
   (a) pectoralis major (c) rectus abdominus
   (b) gluteus maximus (d) latisimus dorsi

3. The smallest muscle of the human body is the _____, which is located in the middle ear.

4. Muscle types fall into three categories, each with a different _____ and _____.

5. Muscle tissue that is generally attached to bones and can be contracted voluntarily is called: _____.
   (a) cardiac muscle tissue (c) skeletal muscle tissue
   (b) smooth muscle tissue (d) none of the above

6. ***Skeletal muscle tissue*** is controlled by the _____ nervous system. (a) central (b) periferal (c) somatic (d) autonomic

7. Skeletal muscle cells have numerous nuclei. _____
   (a) True or (b) False

8. Muscle tissue that exhibits a regular pattern of light and dark bands, caused by the regular arrangement of muscle fibers is referred to as _____ muscle.

9. Muscle tissue that is found in the heart and is not under direct control of the central nervous system is called :_____.
   (a) cardiac muscle tissue (c) skeletal muscle tissue
   (b) smooth muscle tissue (d) none of the above

10. Striated ***cardiac muscle tissue*** is found in various areas of the body.
    (a) True or (b) False

11. Actions of the heart muscles are _____.

12. Heart muscles are controlled by the _____ nervous system.
(a) central (b) somatic (c) autonomic (d) peripheral

13. Spindle-shaped, unstriated muscle tissue found in internal organs and blood vessels that is not under conscious control of the nervous system is called: _____.
(a) cardiac muscle tissue (c) skeletal muscle tissue
(b) smooth muscle tissue (d) none of these

14. Muscle cells of internal organs and blood vessels have multiple nuclei. _____
(a) True or (b) False

15. ***Smooth muscle tissue*** performs operations such as _____, _____ and heartbeat under direction of the _____ nervous system.

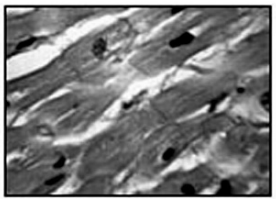
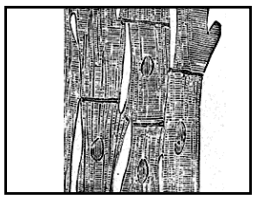
16. Smooth muscles are relatively_____ acting, untiring and steady in movement.

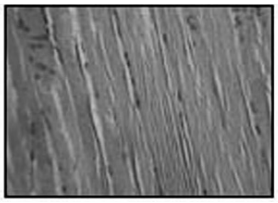
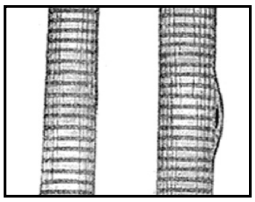
17. Why is it important for cardiac muscle to be under the control of the autonomic nervous system? _____

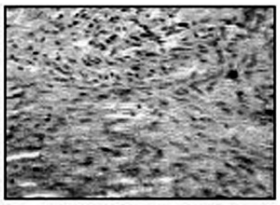
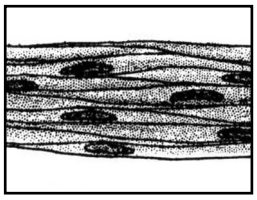
18. **Review questions (#18-20).** From the information in your text, predict which type of muscle tissue would cause chill bumps on the skin when an individual is cold.
_____
(a) skeletal muscle (b) cardiac muscle (c) smooth muscle

19. Why would that be the case? _____

20. Label the types of muscle tissue below as skeletal, smooth or cardiac.



(a) _____



(b) _____



(c) _____

21. _____ work to help restore injured muscle and bone movements and to relieve pain in injured body parts.

22. Write the **Life Principle**: "_____
_____."





THE HUMAN BODY: THE MUSCULAR SYSTEM— PART II

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. ***Myofibrils*** account for the striated appearance of skeletal muscle tissue. _____
   (a) True or (b) False

2. Filaments that are arranged in longitudinal bundles in muscle cells that are composed of ***actin*** and ***myosin*** are called _____.

3. The thicker filaments of a muscle fiber are made up of the protein: _____.
   (a) actin (b) myosin (c) myofibril (d) mytosinol

4. The thinner filaments of a muscle fiber are made up of the protein _____.

5. When a muscle contracts: _____.
   (a) actin and myosin filaments are pulled apart, lengthening the muscle
   (b) actin and myosin filaments slide over each other, shortening the muscle
   (c) actin and myosin fuse to form one single filament that increases strength
   (d) none of the above

6. The concept that thick and thin filaments slide past each other, causing the muscle to contract, is called the: _____.
   (a) cross-linking theory (c) muscle contraction cycle
   (b) sliding filament theory (d) release and reattach theory

7. Skeletal muscle contains very few mitochondria. _____
   (a) True or (b) False

8. The energy storage compound in cells that is produced by oxidative metabolism in the mitochondria is called: _____.
   (a) GMP (b) AMP (c) ATP (d) cGMP

9. Specialized neurons that carry impulses from the brain or spinal cord to muscles or other organs are called: _____.
   (a) sensory neurons (b) motor neurons (c) central neurons (d) spinal neurons

10. The neurotransmitter chemical that causes an action potential, and in turn releases calcium into the cytoplasm of muscle cells, is called: _____.
    (a) acetylcholine (c) norepinerpherine
    (b) epinepherine (d) amphetamine

11. _____, flowing into the cytoplasm of muscle cells, results in muscle contraction.

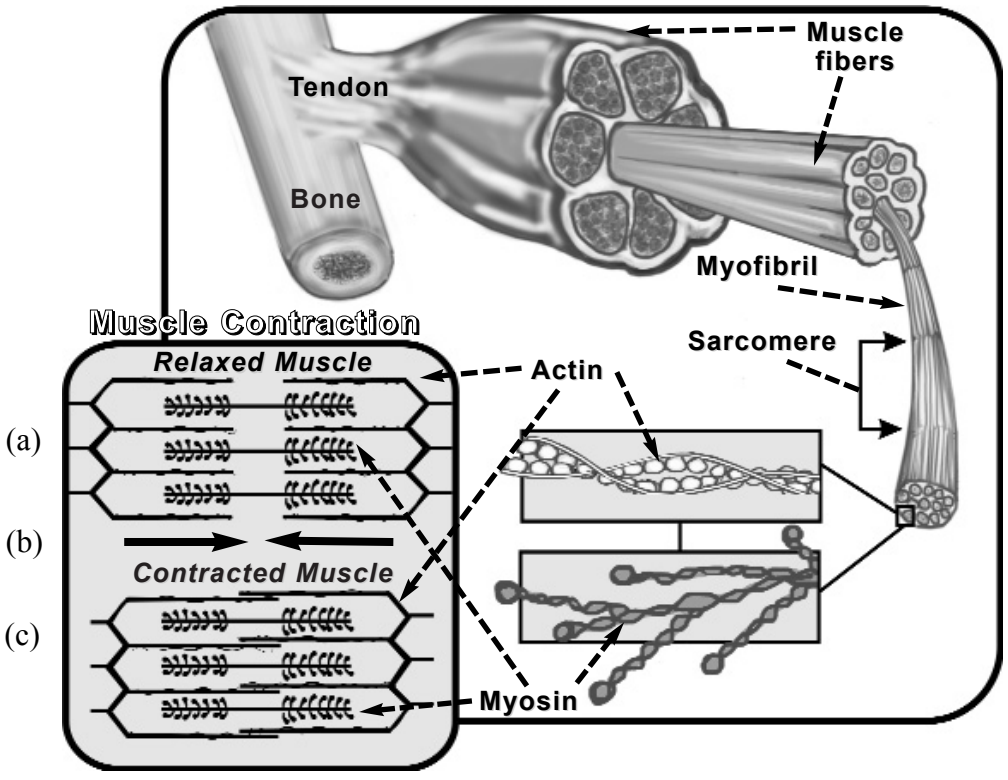
12. Number, in order from 1-6, the stages of muscle contraction and relaxation:
    _____ calcium ions flow into cytoplasm of muscle
    _____ nerve impulse releases acetylcholine
    _____ cross-links form and muscle contracts
    _____ muscle relaxes
    _____ cross-links break down and energy is used up
    _____ muscle contracts

13. Most skeletal muscles are arranged in opposing pairs. _____ (a) True or (b) False

14. The fingers of a human hand contain 58 different tendons. _____
    (a) True or (b) False

15. Each hand has _____ muscles, not counting the fingers which have no muscles.

16. **Review.** Briefly describe the process illustrated by the figure below.
    (a) _____
    (b) _____
    (c) _____



17. Write the **Life Principle**: _____
    _____."

Note: Ask your teacher for the quiz over topics 11 - 15 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!