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Biology, Study Guide 1

(Living Organisms, Cells, Skeletal System, Muscular System, Integumentary System)

Definitions

Cell	
Tissue	
Organ	
Organ System	
Organelle	
Homeostasis	
Unicellular	
Multicellular	
DNA	
Joint	
Synovial Fluid	
Ossification	
Ligament	
Sprain	

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Define Two Types of Observation

Quantitative observation _____

Qualitative observation _____

Data & Inference, the differences

Data _____

Inference _____

6 characteristics of living organisms

1 All living organisms _____
2 All living organisms _____
3 All living organisms _____
4 All living organisms _____
5 All living organisms _____
6 All living organisms _____

3 Parts of Cell Theory

1	
2	
3	

Types of Cells

Prokaryote Cell _____

Eukaryote Cell _____

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Cell organelles, location and their function

Cell Membrane	
Golgi Apparatus	
Cell Wall	
Cytoplasm	
Mitochondria	
Cytoskeleton	
Nucleus	
Lysosome	
Nucleolus	
Vacuole	
Ribosomes	
Chloroplast	
Rough ER	
Smooth ER	

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Plant Cell vs Animal Cell

Name 3 structures that Plant Cell have and Animal Don't.

1 _____
2 _____
3 _____

Levels of Body Organization :

1 _____
2 _____
3 _____
4 _____
5 _____

Types of Animal Tissue, define their functions:

1 Muscle Tissue

2 Nerve Tissue

3 Epithelial

4 Connective

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Main Functions of 11 Body Systems (1 sentence description)

1. Skeletal System	
2. Muscular System	
3. Integumentary System	

4. Cardiovascular System	
5. Lymphatic SYstem	
6. Respiratory System	
7. Digestive System	
8. Urinary System	
9. Nervous System	
10. Endocrine System	
11. Reproductive System	

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Functions of the skeletal system :

1 _____

2 _____

3 _____

4 _____

5 Types Of Bones

1 _____
2 _____
3 _____
4 _____
5 _____

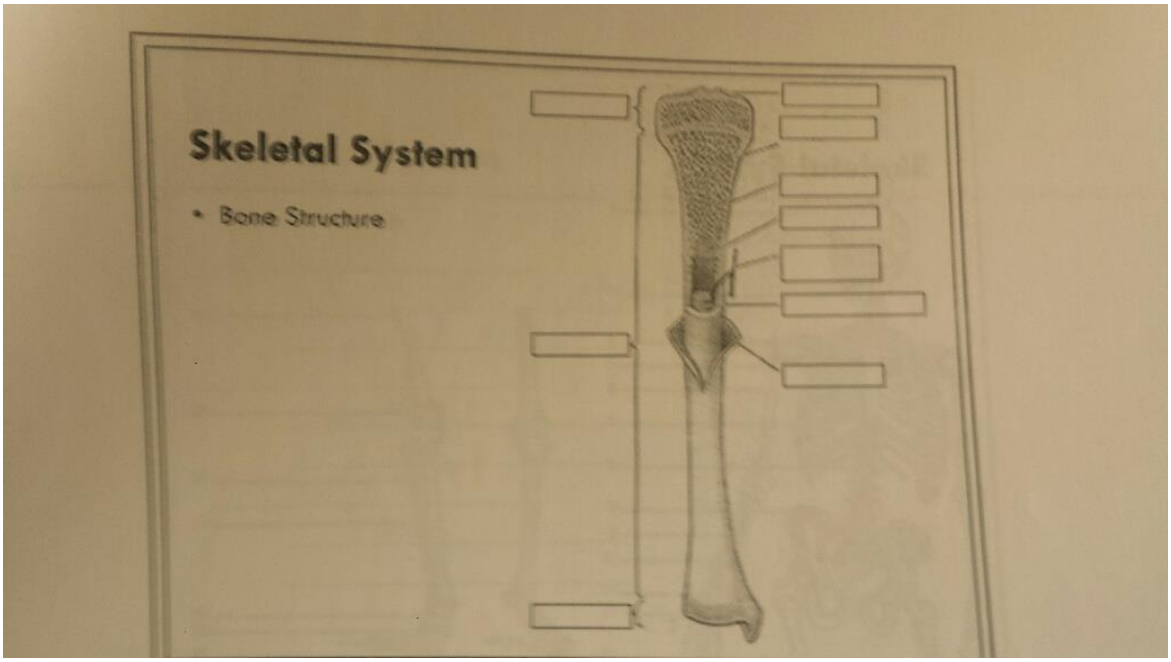
2 Types of Bone Tissue

1 _____

2 _____

Structure Of a long bone – study & fill up the chart:

Diaphysis	Main or shaft of a long bone
Epiphysis	Ends
Compact Bone	Forms extremely hard exterior
Spongy Bone	Fills hollow interior
Marrow Cavity	Central cavity of bone shaft where marrow is stored
Periosteum	Membrane that lines outer surface of a bone
Cartilage	Tissue that covers the epiphysis of long bone
Growth Plate	Cartilage plate at each end of long bone



3 Types of Bone Cells, their functions

Osteoblasts _____

Osteocytes _____

Osteoclasts _____

2 Types of Marrow (functions & location)

Marrow is flexible tissue inside the bone.

Red Marrow _____

Yellow Marrow _____

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5 Types of Joints

1 _____

2 _____

3 _____

4 _____

5 _____

6 Types of Bone Breaks

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

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Muscular System

Muscular system – is made up of _____ that let you _____.

Function of Muscular System Allows the human body to move through an efficient system of muscles _____ and _____.

Voluntary - Muscle action that is under _____.

Involuntary – Muscle action that is not _____.

Type of Muscles

- ✓ _____ **Muscles** – Found only in heart. Its function is to keep the heart beating. These are involuntary muscles. They appear striated.
- ✓ _____ **Muscles** – Found in the walls of most organs. They carry out actions that we don't have to think about like breathing, moving food through digestive track, etc). These are involuntary muscle. They appear spindle-shaped
- ✓ _____ **Muscles** – Found everywhere. Its function is to move bones in the body. Can be both voluntary and involuntary – for example blink of eye can be both. Skeletal muscles work in pairs. When the biceps muscle contracts, the arm bends. When the triceps muscle contracts, the arm straightens. They are striated in appearance.

What are tendons? _____

Flexor – a muscle that _____

Extensor - a muscle that _____

Anatomy of muscles

Muscles are made up of muscle cells, called **muscle fiber**. Muscles are divided into groups of muscle fibers surrounded by connective tissue - called **fascicles**; muscle fibers, in turn, are divided into contractile units called **myofibrils.**

Myofibrils - is a basic rod-like unit of a muscle.

Each individual fibre consists can be further broken down into hundreds or even thousands of **myofibrils**. Myofibrils are surrounded by **sarcoplasm** and together they make up the contractile components of a muscle.

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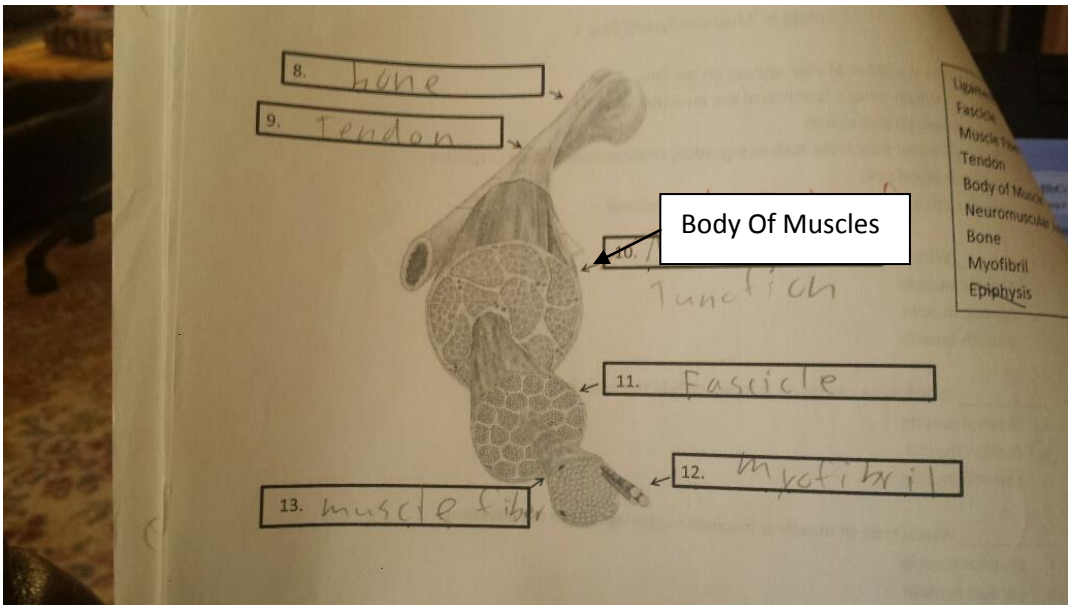
See the diagram below:



Each myofibril is organized into sections along its length. Each section is called a **sarcomere** and they are repeated right along the length of a muscle fibre. It's similar to how a meter ruler is split into centimeters and millimeters. Just as the millimeter is the smallest function of a ruler, the sarcomere is the smallest contractile portion of a muscle fibre. Sarcomeres are composed of long, fibrous proteins that slide past each other when the muscles contract and relax.

What makes us stronger ? _____

Large muscles means **increased # of** _____

Exercise can increase muscle strength. Define type of exercise:

_____– working against resistance of different object. Great way to strengthen skeletal muscles.

_____ – steady, moderately intense activity. Can increase muscle strength but mostly strengthen the heart and increase endurance.

_____ Oxygen is not present with this exercise. Glycogen is used as fuel. Once all the glycogen has been depleted (usually in about two hours) you can expect to hit the proverbial wall.

Benefits of Anaerobic Exercise
Anaerobic exercise helps build lean muscle mass. Calories are burned more efficiently in bodies that have more muscle. Anaerobic exercise is especially helpful for weight management in that it helps to burn more calories even in a body at rest. Anaerobic exercise can also help build endurance and fitness levels.

Aerobic & Anaerobic Glycolysis

Energy is stored in your cells in the form of a compound called adenosine triphosphate, or **ATP**, which can be broken down quickly to provide immediate energy.

Anaerobic glycolysis provides energy by the (partial) breakdown of glucose without the need for oxygen. Anaerobic metabolism produces energy for short, high-intensity bursts of activity lasting no more than several minutes before the lactic acid build-up reaches a threshold known as the lactate threshold and muscle pain, burning and fatigue make it difficult to maintain such intensity.

Aerobic metabolism fuels most of the energy needed for long duration activity. It uses oxygen to convert nutrients (carbohydrates, fats, and protein) to ATP.

Injuries

1 _____ is an injury in which a muscle or tendon is overstretched or torn

2 When people exercise too much they can hurt their tendons, which then gets inflamed. This condition called _____. Long rest is needed for the injured tendon to heal.

_____is a drug that can make your muscles bigger and stronger. They can cause long term health problems. They can hurt heart, liver, kidneys, cause high blood pressure, can stop bones from growing.

What is **RICE**?
The term RICE stands for Rest, Ice, Compression, and Elevation.

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RICE is used as the first treatment for many muscle strains, ligament sprains, or other bruises and injuries. RICE is used immediately after an injury happens and for the first 24 to 48 hours after the injury. Rest, ice, compression, and elevation can help reduce the swelling and pain and help you heal faster.

Skeletal muscles are told what to do by the nervous system. They only contract when told to do so at the _____, which is the connection between the nervous system and the muscle fiber.

_____ is increased number of myofibrils per muscle fiber, which increases the overall muscle size.

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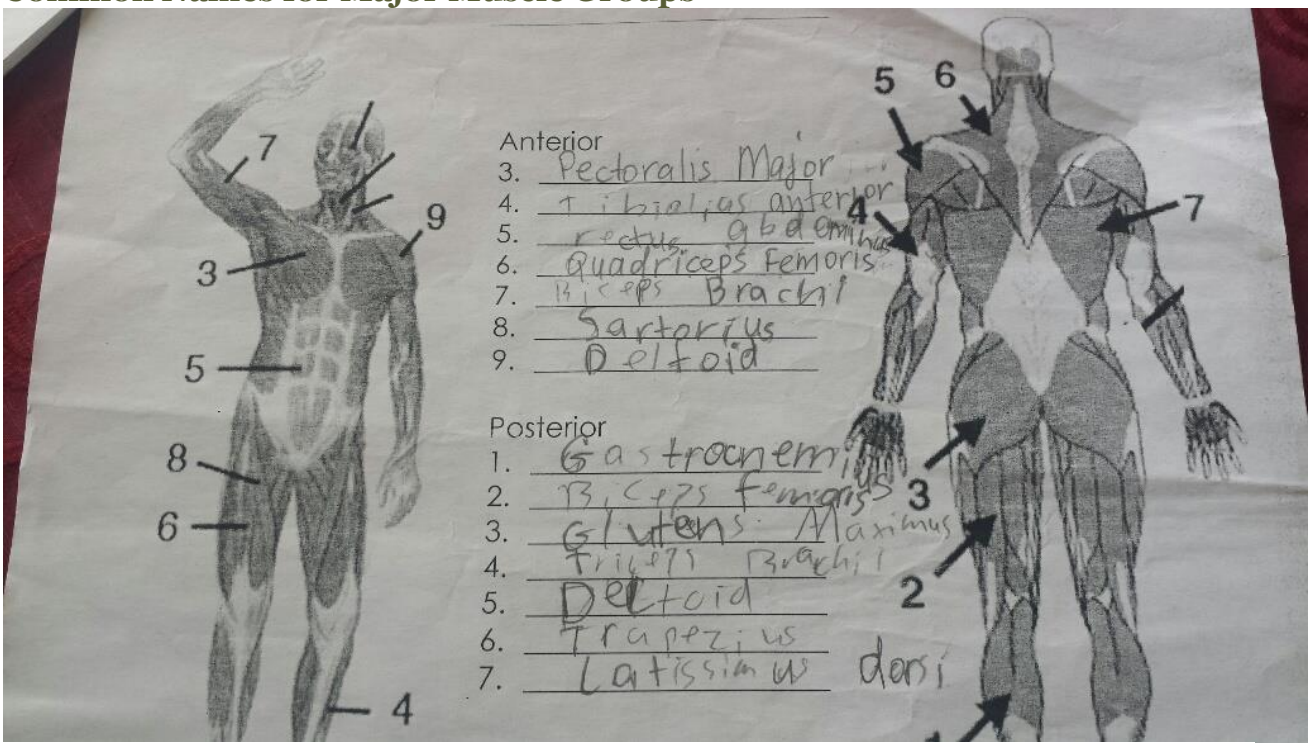
Common Names for Major Muscle Groups



Smooth muscles are always called _____

What connect muscles to bones? _____

What controls our skeletal muscles? _____

How can you make your muscular system strong? _____

What are antagonistic muscle pair? How do they work? _____

Which exercise strengthens muscles by training against an opposite force?_____

Which is NOT a benefit of stretching before an exercise?

a) It makes muscles longer and more flexible
b) It increases oxygen flow to the muscle
c) It decreases lactic acid built up in your muscles
d) It strengthens your heart and your lungs

Name a resistant exercise: _____

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Integumentary System

1. What is the largest organ in the body ?

    a) The heart
    b) The lungs
    c) The skin
    d) The stomach

2. How many layers does skin has ?

3. **Functions of the skin - Match :**

Protection	(Through thermoreceptors & sweat glands)
Vitamin D synthesis	(reduce water loss, UV protection, protects from invasion)
Sensation	(with sweat)
Thermoregulation	(helps us keep in touch with outside world – heat, cold, pain)
Removes waste	(absorbs Vitamin D to maintain health of skeleton)

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4. _____ - chemical that determines color of skin.
5. Melanin absorbs UV light from sun and reduces damage to skin that can lead to skin cancer:

    a. True b. False

6. _____ make sweat and help reduce body temperature.
7. **Structure of Dermis: small structures - define their functions**

Blood vessels _____

Nerve fibers _____

Hair follicles _____

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Muscle fibers _____

Oil glands _____

Sweat glands _____

8. _____ is the outmost layer of skin
9. The thickest layer of skin is _____
10. Epidermis is made of _____ tissue
11. Most cells of Epidermis are _____
12. _____ is a protein that is in Epidermis' cells and makes the skin tough
13. _____ is a protein that makes fibers in Dermis
14. Fibers in Dermis provide _____ and _____
15. Top layer of Epidermis is _____ _____
16. Cells producing protein keratin are called _____
17. Cells of Stratum Corneum are _____
18. The deepest layer of Epidermis is _____ _____
19. Following cells make up Stratum Basale :
    - ✓ keratinocytes,
    - ✓ melanocytes (make melatin)
    - ✓ tactile cells (are tough receptors)
20. Epidermis also has Langerhans' cells , which :
    - ✓ help detect foreign substances
    - ✓ defend the body against infection
    - ✓ play role in developing skin allergies
21. Sebaceous Glands secrete _____ into hair follicles.
22. **Sebum** is an oil that keeps the skin moist and soft and acts as a barrier against foreign substances.

23. Fat Layer :

- ✓ helps insulate the body from heat and cold
- ✓ serves as energy storing area

24. Far layer consists of _____ cells

25. _____ _____ small muscles attached to hair follicle.

26. Contractions of Arrector Pili makes hair to _____

27. Goose bumps are results of contraction of _____ _____

28. Goose bumps – thermal insulation (not so much in humans as in animals)

29. Acne is inflammation of :

a) Oil glands
b) Sweat glands
c) Arrector Pili

30. Hair and nails are made of _____ and _____ cells

31. Hair forms at the bottom of _____ _____

32. The only living cells in hair are in _____ _____

33. Hair gets its color from melanin : True False

34. Hair protects skin from Ultra Violet light: True False

35. Nail grows from _____ cells in _____ _____ at the base of nail

36. Nails protect the tips of _____

37. Which is true about hair follicle :

a) It contains living cells
b) It makes new skin
c) It contains all dead cells
d) It contains keratin

38. Ways that skin can be damaged :

1. _____
2. _____

3. _____

39. Can skin repair itself?

40. How does skin heal the cut ?

1. _____
2. _____
3. _____