

Name: _____

Class: IB SEHS

Teacher: Mrs. Stuckey

School: Seneca Valley High School

Year: _____

IB SEHS Anatomy Handbook



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Introduction and Note to Students

Dear Future SEHS Student,

Welcome to IB Sports, Exercise, and Health Sciences. In this fast-paced, one-year class, we will be learning all about the human body and how it functions through the lens of sports and exercise. We will also be covering nutritional needs, sports psychology, training program design, and much more. I'm very excited for us to run, jump, and exercise together. (Yes, really, it's exercise science!!)

Because this class only runs for one year and we have a lot of really interesting (and sometimes challenging!) content to cover before the test in May, your summer assignment is to learn the basic structures and functions you will be responsible for knowing this year. The majority of this is plain old memorization - not the most fun, but very necessary!

Please complete the packet during the summer. Not only should you fill in the packet, but you should also study the material so you are comfortable with it before we start. I will be checking this packet for HW credit and you will be taking a quiz on the content within the first 2 weeks of school!

To prepare for next year, you can do the following:

- Complete this packet and familiarize yourself with it's contents
- Bring in a 2" binder

If you have any questions or concerns, please email me at meaghan.s.stuckey@mcpsmd.net.

I look forward to spending next year with you!

Have a great summer,


Mrs. Stuckey

Anatomical Position Diagram

Draw the **anatomical starting position**. Draw both the front and back of the body. You may also print a picture and insert it.

Anatomical Position

Key Terms

1.1.5 Apply the anatomical terminology to the location of bones.

Anatomical Position Term	Definition	Use the term in a sentence to compare the location of 2 different bones
Inferior		
Superior		
Proximal		
Distal		
Medial		
Lateral		
Posterior		
Anterior		

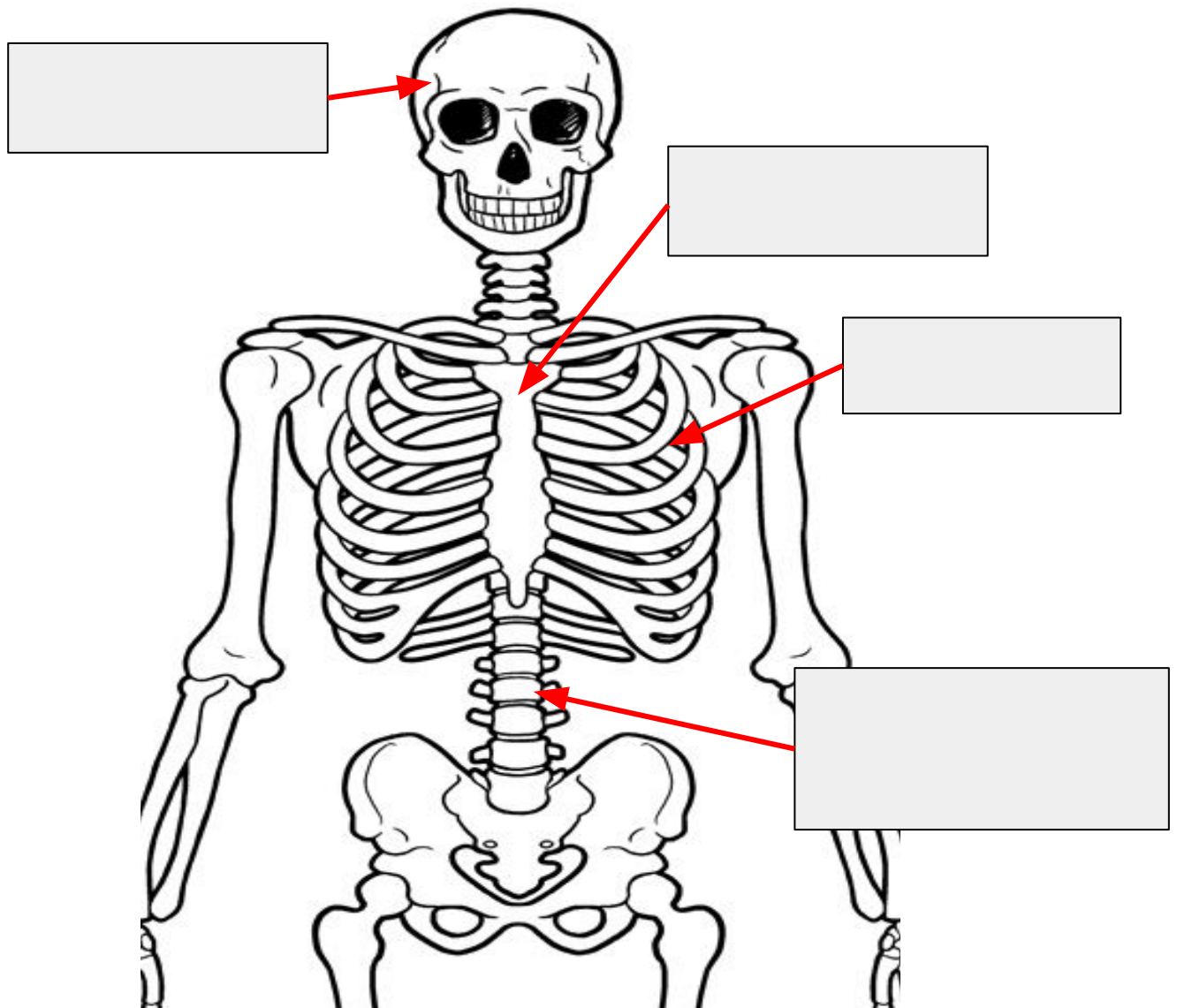
Axial Skeleton Overview

1.1.1 - **Distinguish** anatomically between the axial and appendicular skeleton.

Label and **color** the following bones on the *axial* skeletons below (use a different color for each type of bone)

The Axial Skeleton Overview:

- Skull
- Ribs
- Sternum
- Vertebral Column



Axial Skeleton

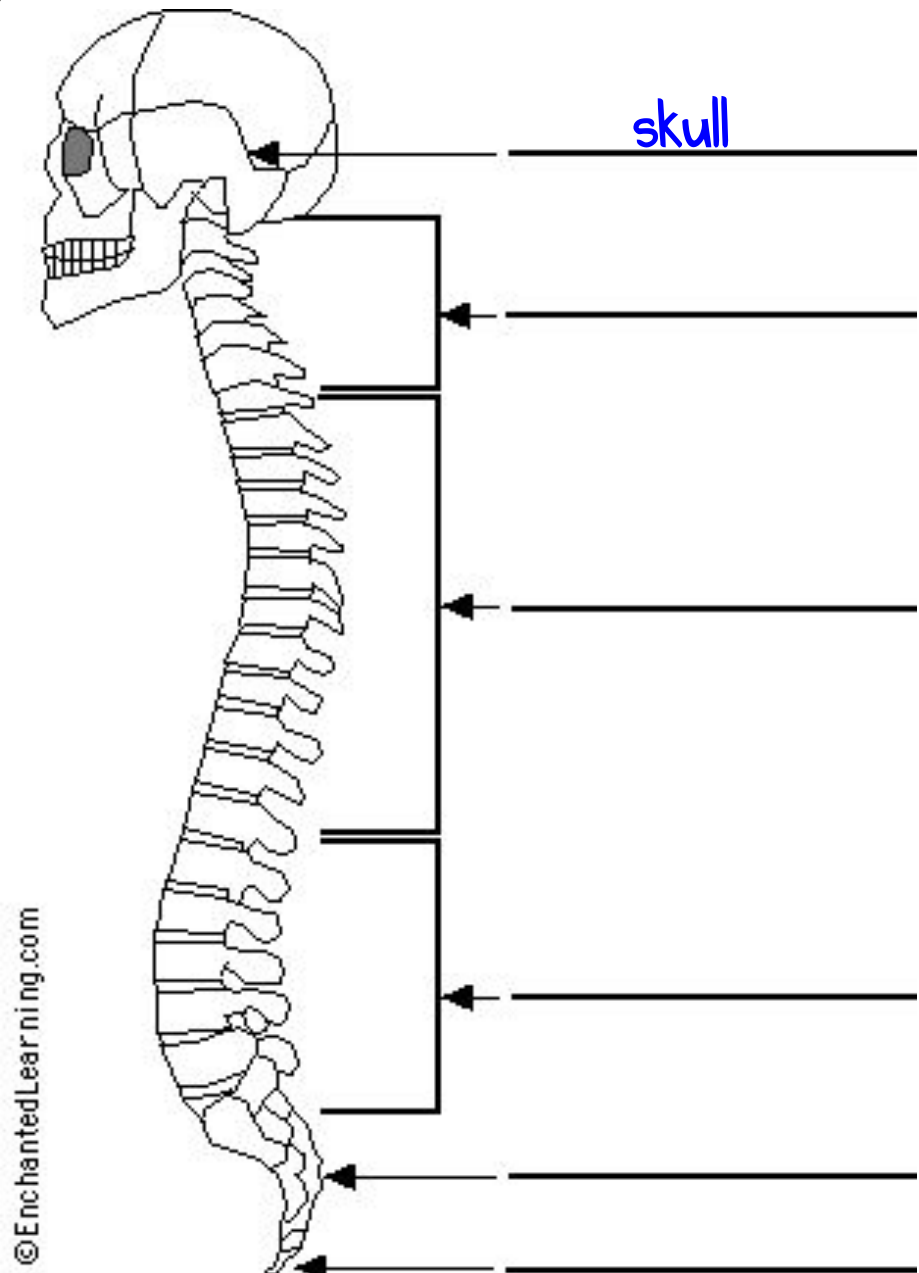
Vertebral Column Detail

1.1.1 - **Distinguish** anatomically between the axial and appendicular skeleton.

Label and **color** the following bones on the *axial* skeletons below (use a different color for each type of bone)

Vertebral Column Detail

- Cervical vertebrae (7)
- Thoracic vertebrae (12)
- Lumbar vertebrae (5)
- Sacral (5 fused)
- Coccyx (4 fused)

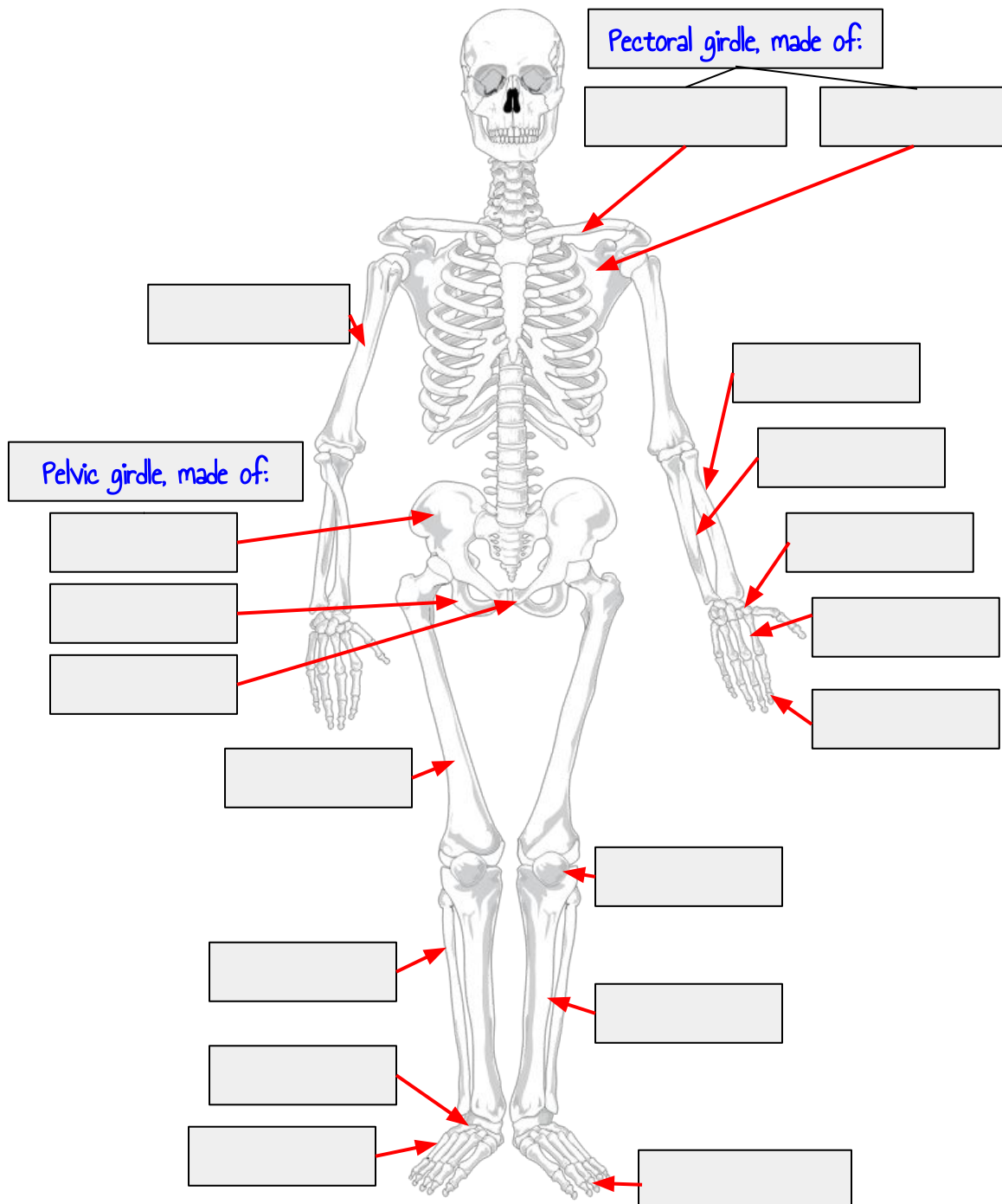


Appendicular Skeleton

1.1.1 - Distinguish anatomically between the axial and appendicular skeleton.

Label and color the following bones on the *appendicular* skeletons below (use a different color for each type of bone)

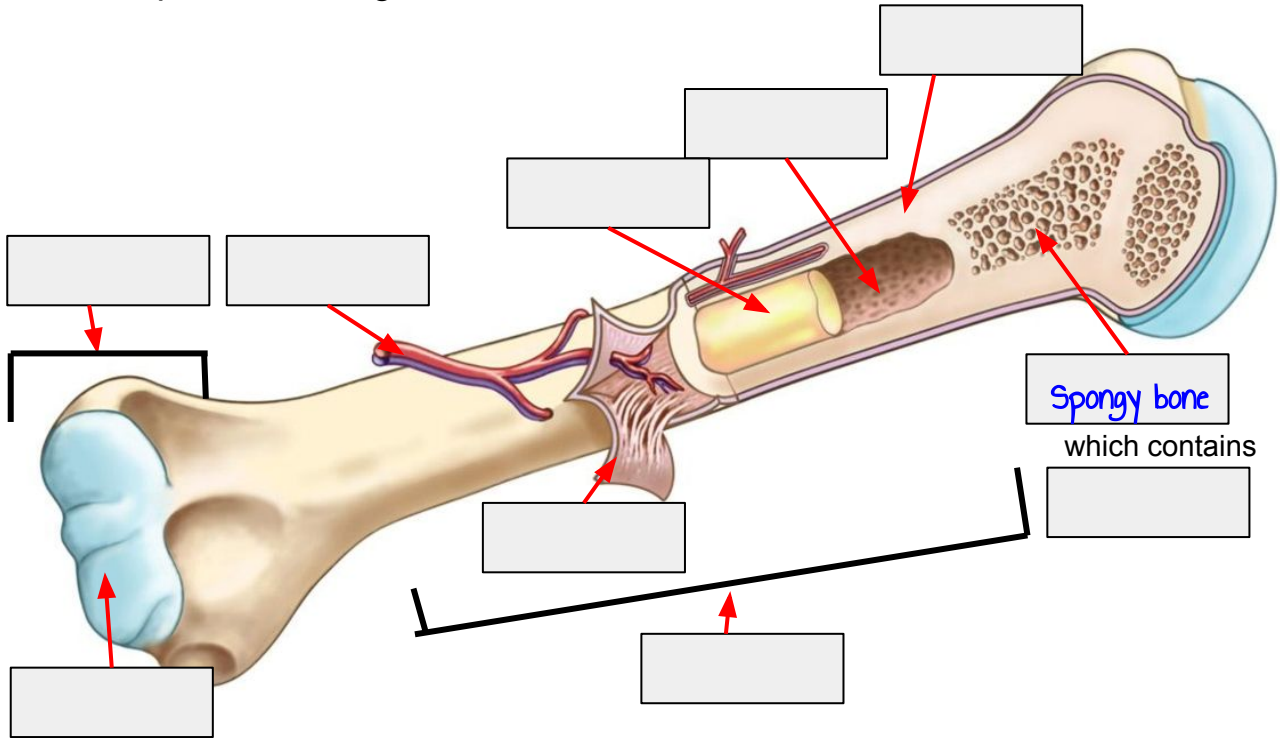
- | | | | | | |
|--------------------------------------|---|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| <input type="checkbox"/> scapula | <input type="checkbox"/> clavicle | <input type="checkbox"/> humerus | <input type="checkbox"/> radius | <input type="checkbox"/> ulna | <input type="checkbox"/> carpals |
| <input type="checkbox"/> metacarpals | <input type="checkbox"/> phalanges (x2) | <input type="checkbox"/> ilium | <input type="checkbox"/> ischium | <input type="checkbox"/> pubis | <input type="checkbox"/> femur |
| <input type="checkbox"/> patella | <input type="checkbox"/> tibia | <input type="checkbox"/> fibula | <input type="checkbox"/> tarsals | <input type="checkbox"/> metatarsals | |



Long Bones

1.1.4 - Draw and annotate the structure of a long bone.

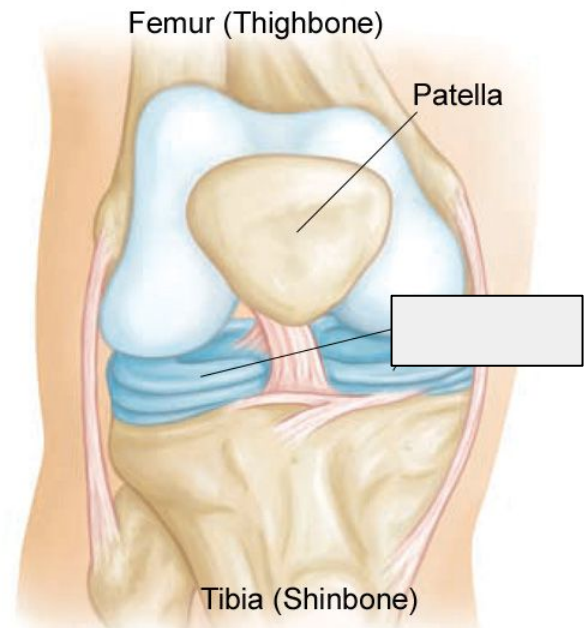
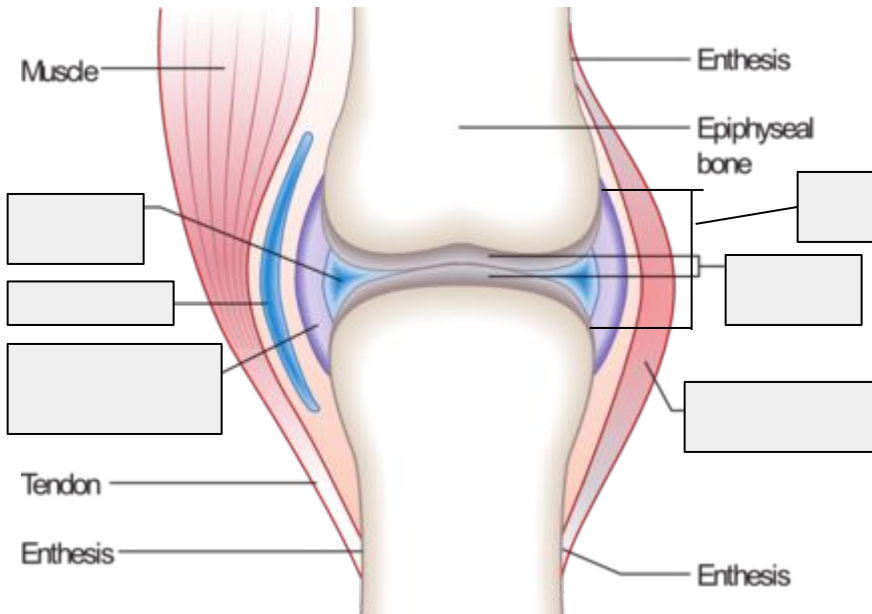
Label the diagram using the terms from the chart. Complete the chart with the functions of the different parts of a long bone.



Structure	Function
Epiphysis	
Spongy bone	
Articular cartilage	
Diaphysis	
Compact bone	
Yellow bone marrow	
Red bone marrow	
Medullary (marrow) cavity	
Blood vessel (nutrient foramen)	
Periosteum	

Synovial Joint Structure?

1.1.9 - Outline the features of a synovial joints.



Use the terms in the chart below to label diagrams

Structure	Function
Articular cartilage	
Synovial membrane	
Synovial fluid	
Bursae	
Meniscus	
Ligament	
Articular capsule	

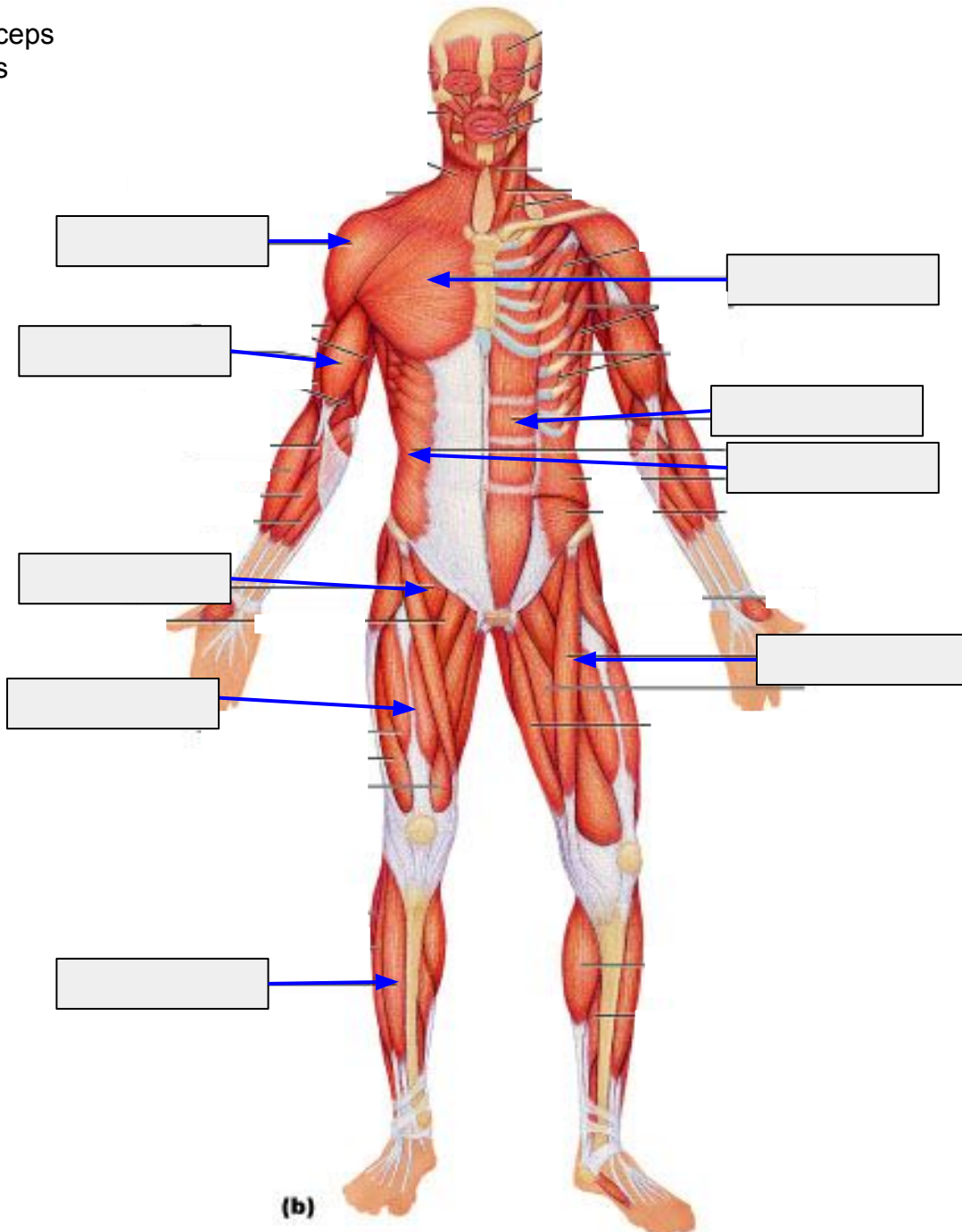
Muscles of the Body

Anterior Overview

1.2.5 - Identify the location of skeletal muscles in various regions of the body.

Label the *anterior muscles* below.

- deltoid
- iliopsoas
- pectoralis
- sartorius
- tibialis anterior
- external oblique
- abdominus rectus
- biceps brachii
- quadriceps femoris



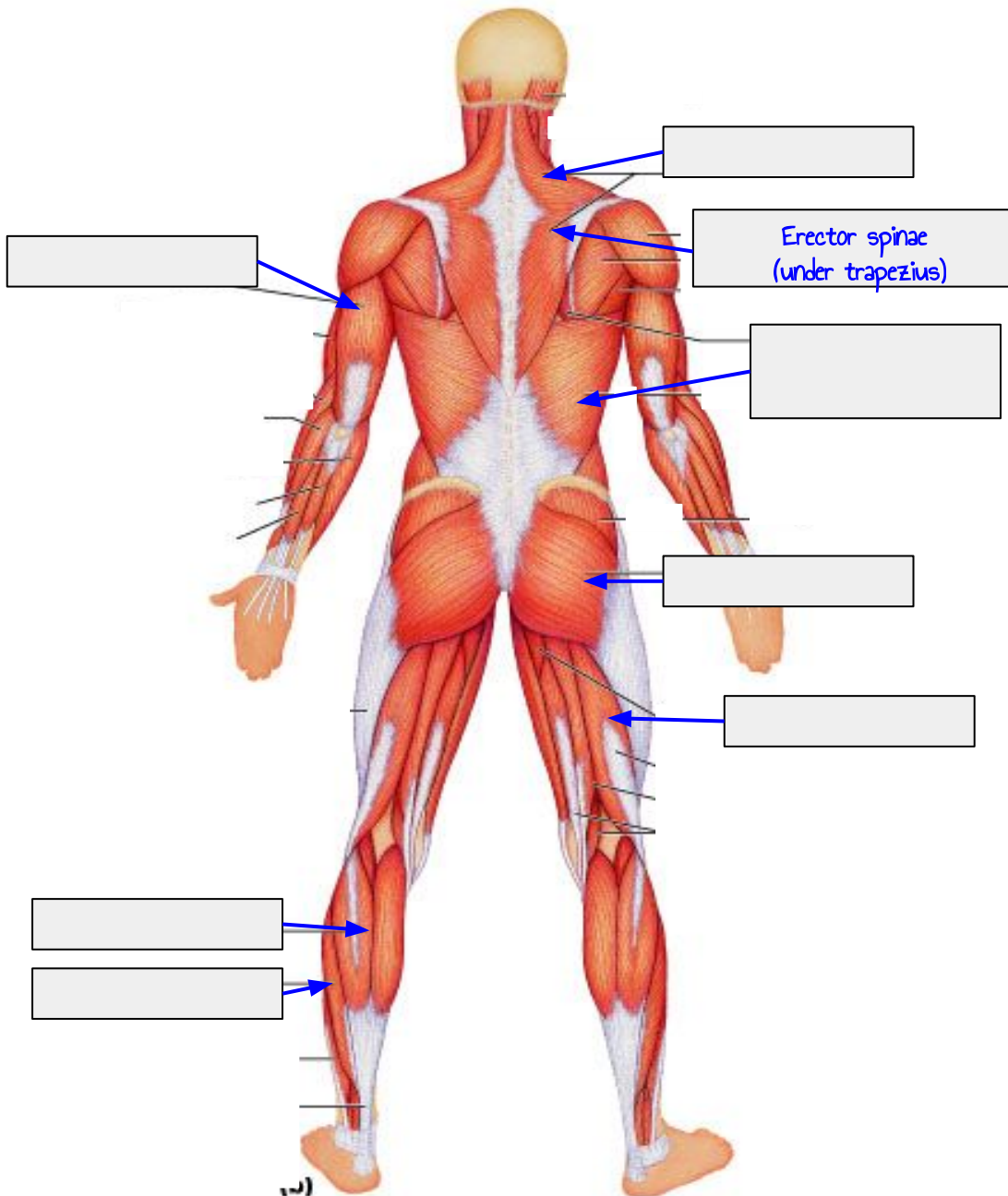
Muscles of the Body

Posterior Overview

1.2.5 - Identify the location of skeletal muscles in various regions of the body.

Label the *posterior muscles* below.

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> trapezius | <input type="checkbox"/> latissimus dorsi | <input type="checkbox"/> gastrocnemius | <input type="checkbox"/> erector spinae |
| <input type="checkbox"/> triceps brachii | <input type="checkbox"/> gluteus maximus | <input type="checkbox"/> soleus | <input type="checkbox"/> hamstring |



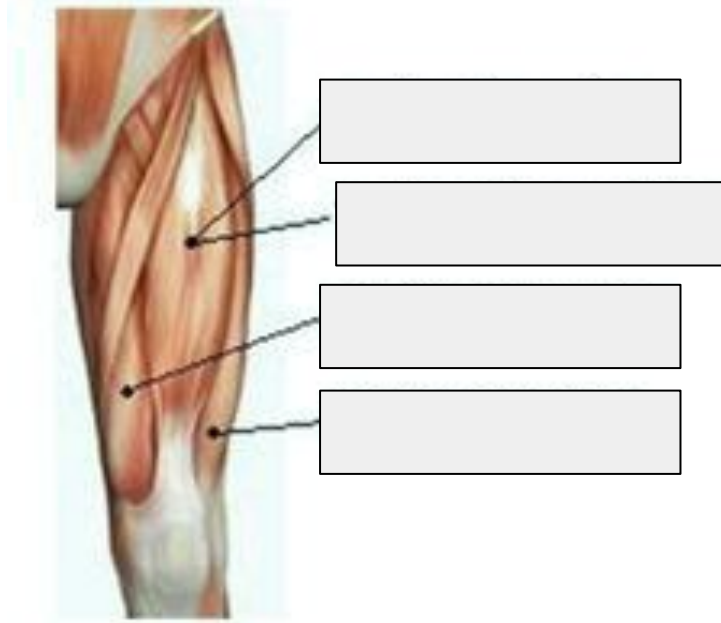
Muscles of the Body

Quadriceps Femoris and Hamstring

1.2.5 - Identify the location of skeletal muscles in various regions of the body.

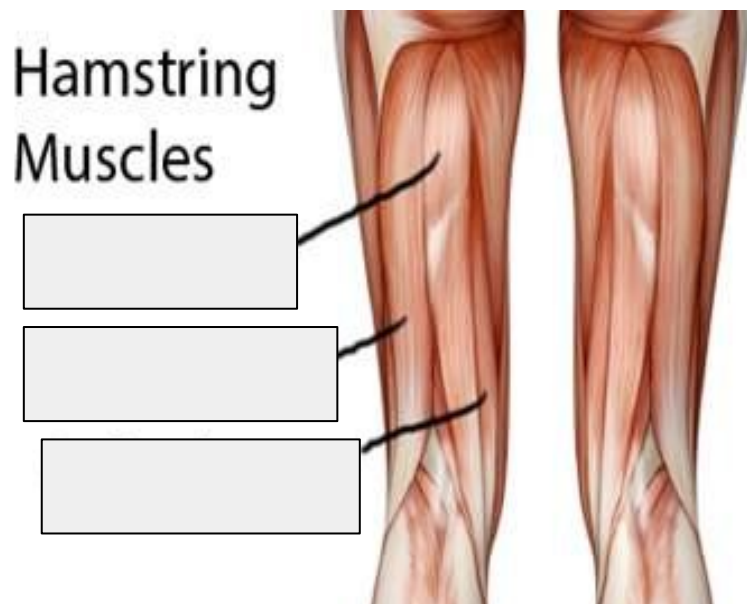
The **quadriceps** femoris is a group of 4 muscles that make up your anterior thigh. **Label** the *anterior* closeup of the *quadriceps* below.

- Vastus medialis
- Rectus femoris
- Vastus lateralis
- Vastus intermedius



The **hamstring** is a group of 3 muscles that make up your posterior thigh. **Label** the *posterior* closeup of the *hamstring* below.

- Semimembranosus
- Biceps femoris
- Semitendinosus



Skeletal Muscle Structural Hierarchy

1.2.3 - Annotate the structure of skeletal muscle

Label the diagram using the terms from the chart on the next page.

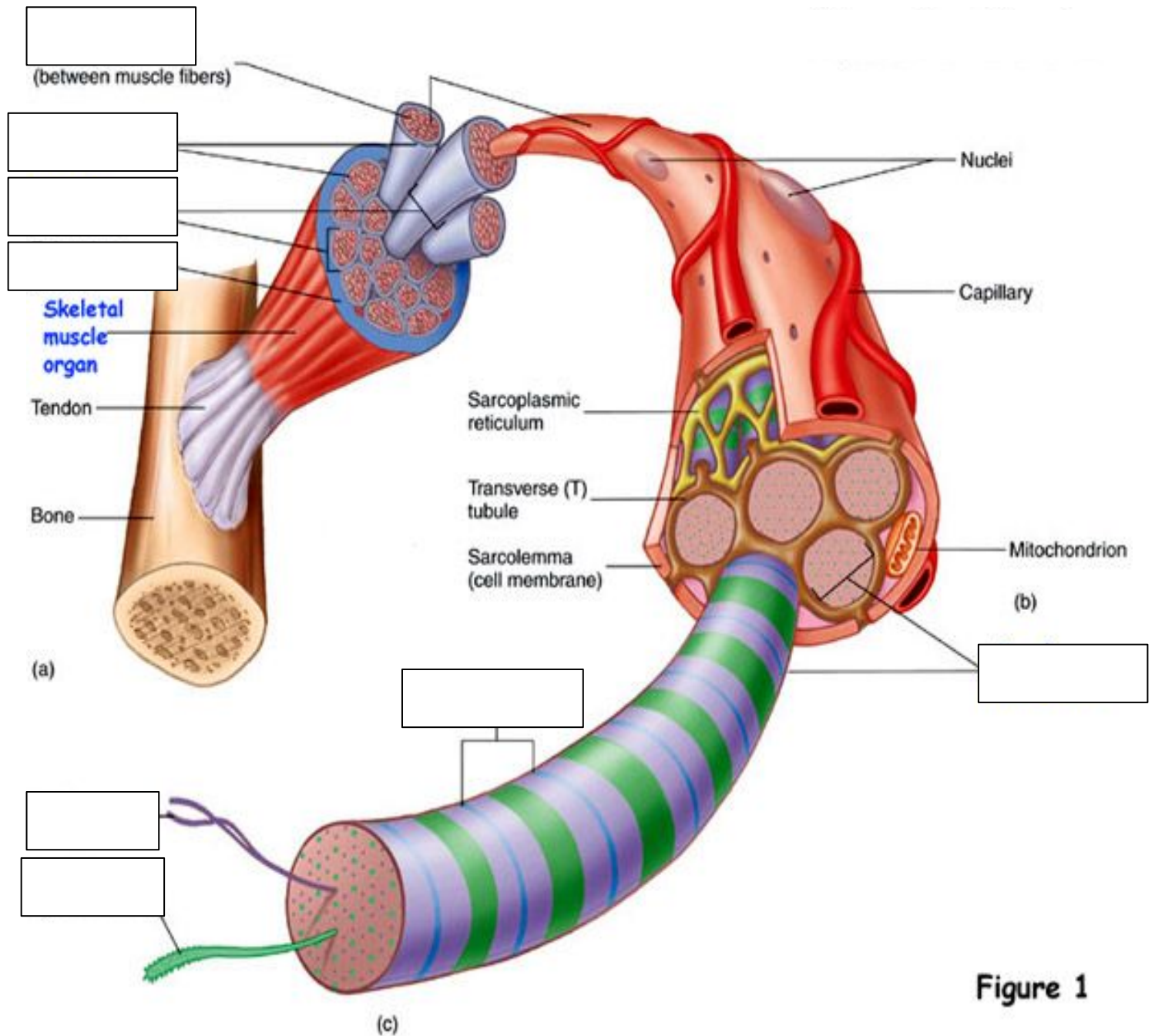


Figure 1

Skeletal Muscle Structural Hierarchy

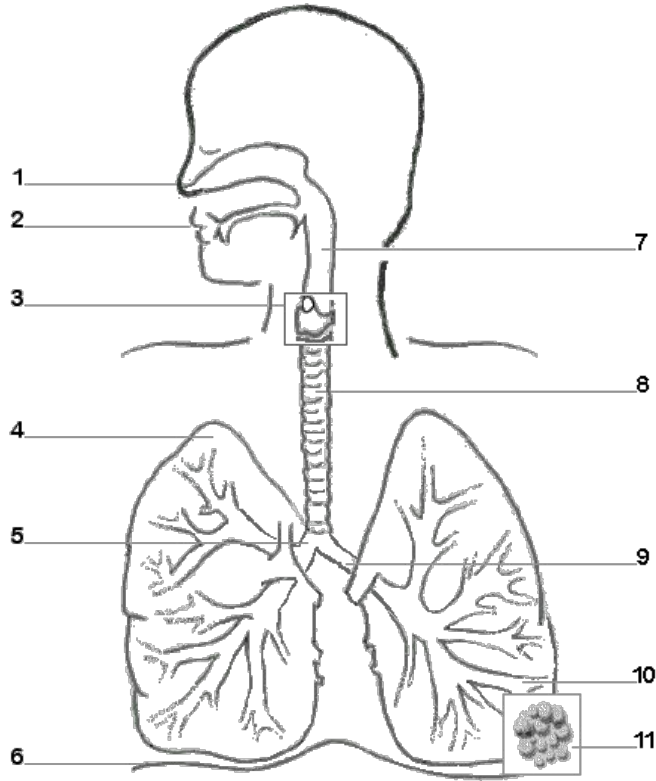
1.2.3 - Annotate the structure of skeletal muscle

Complete the chart with the **functions** of the different parts skeletal muscle.

Term	Definition
epimysium	
perimysium	
endomysium	
muscle fiber	
myofibril	
sarcomere	
actin	
myosin	

Ventilatory System

2.1.1 - List the principle structures of the ventilatory system.



Part	Function
Nose	
Mouth	
Pharynx	
Larynx	
Trachea	
Left/right bronchi (separate #s above)	
Bronchioles	
Lungs	
Diaphragm	
Alveoli	

Heart Chambers and Valves

2.2.3 - Describe the anatomy of the heart with reference to the *heart chambers, valves,* and major blood vessels.

Label and color the diagram below

four chambers

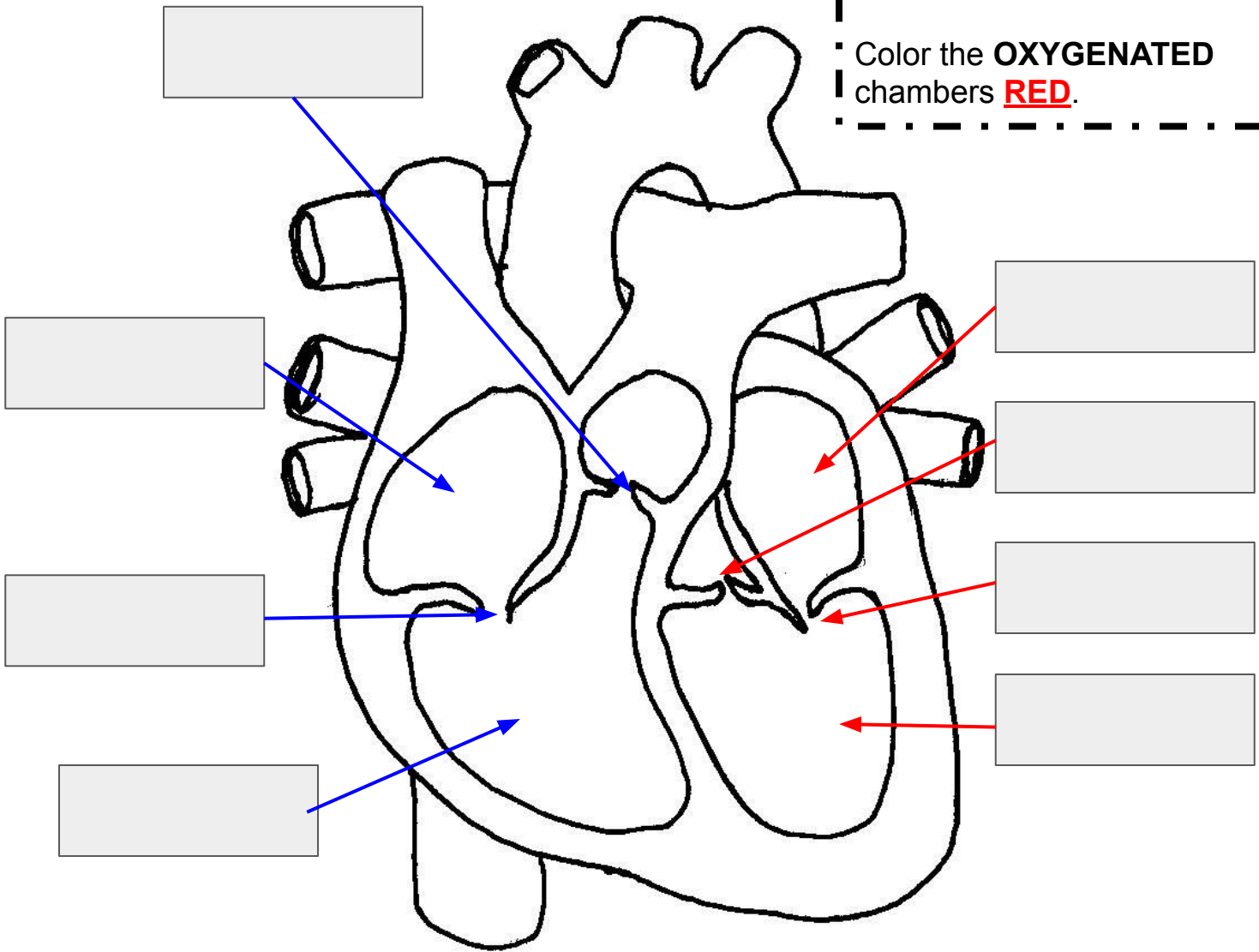
- Right Atrium
- Left Atrium
- Right Ventricle
- Left Ventricle

four valves

- Bicuspid valve (Mitral valve)
- Tricuspid valve
- Aortic valve
- Pulmonary valve

Color the **DEOXYGENATED** chambers **BLUE**.

Color the **OXYGENATED** chambers **RED**.



Heart

Major Blood Vessels

2.2.3 - Describe the anatomy of the heart with reference to the *heart chambers, valves,* and major blood vessels.

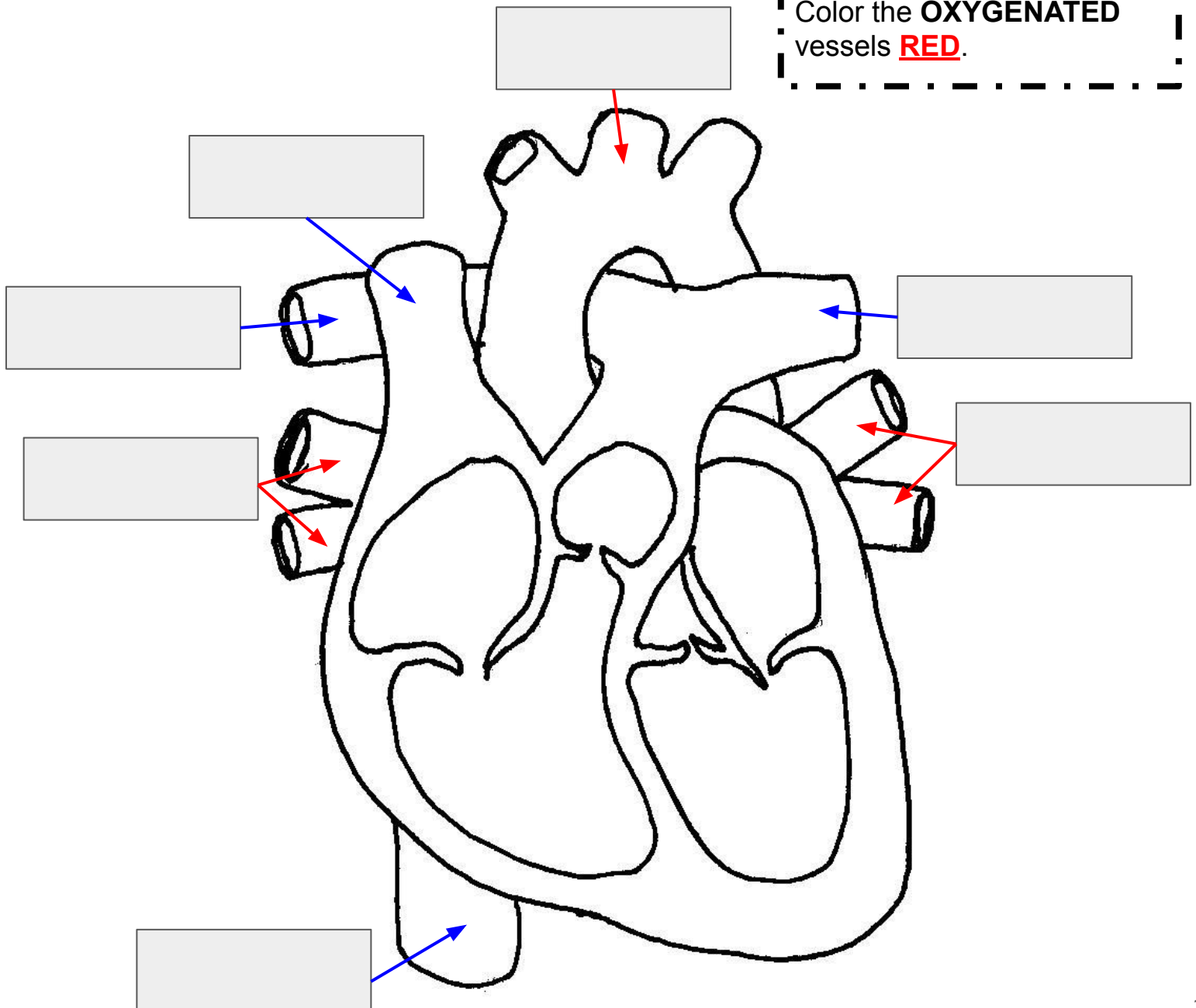
Label and color the diagram below

four major blood vessels

- vena cava (inferior AND superior)
- pulmonary veins (x2 - left and right)
- Aorta
- pulmonary artery (x2 - left and right)

Color the **DEOXYGENATED** vessels **BLUE**.

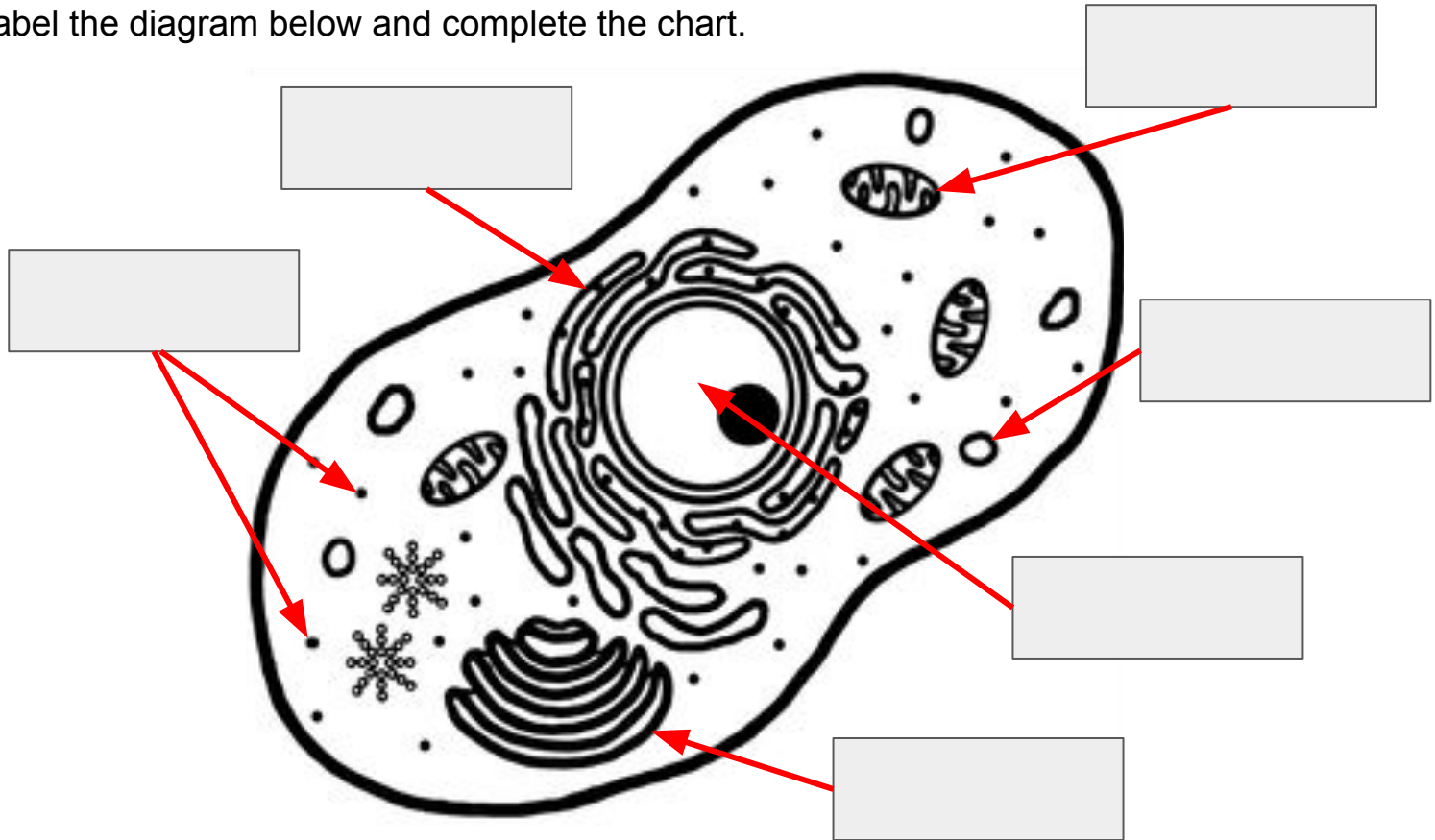
Color the **OXYGENATED** vessels **RED**.



Animal Cell Ultrastructure

3.3.1 - **Annotate** a diagram of the ultrastructure of an animal cell.

Label the diagram below and complete the chart.

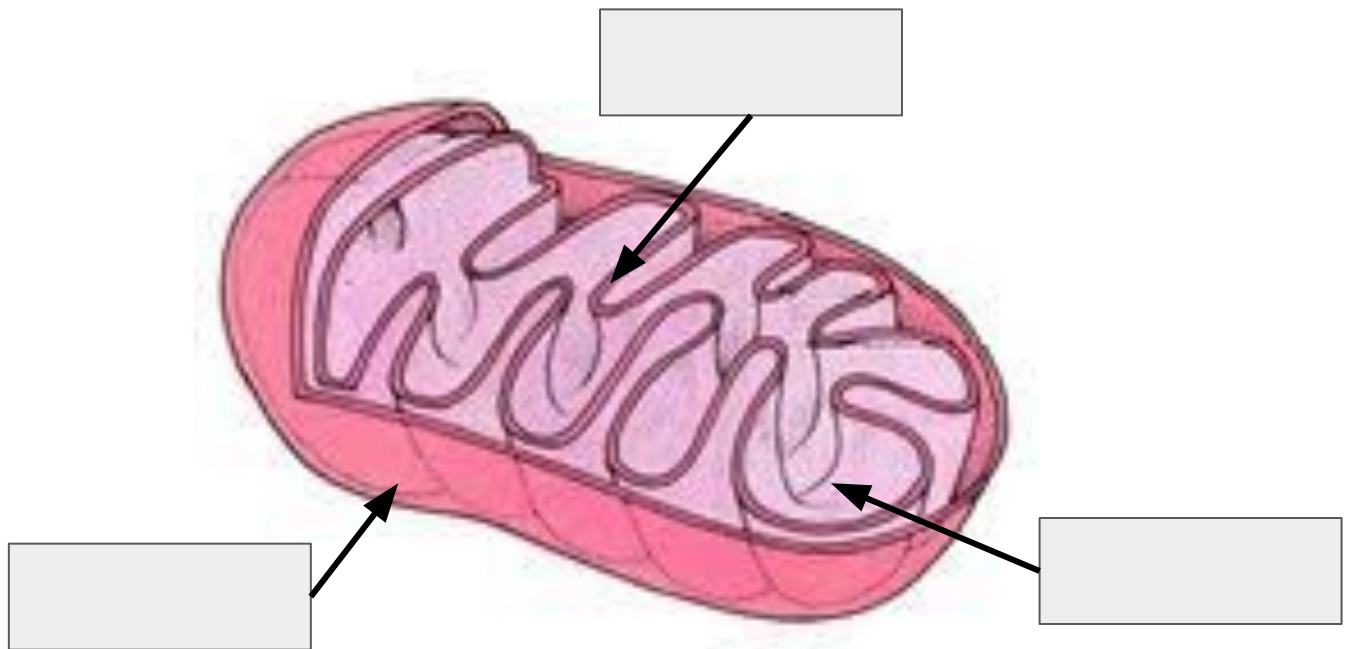


Organelle	Main Function
ribosomes	
rough endoplasmic reticulum	
lysosomes	
Gogli apparatus	
mitochondrion	
nucleus	

Mitochondrion Ultrastructure

3.3.2 - Annotate a diagram of the ultrastructure of a mitochondrion.

Label the diagram below and complete the chart.



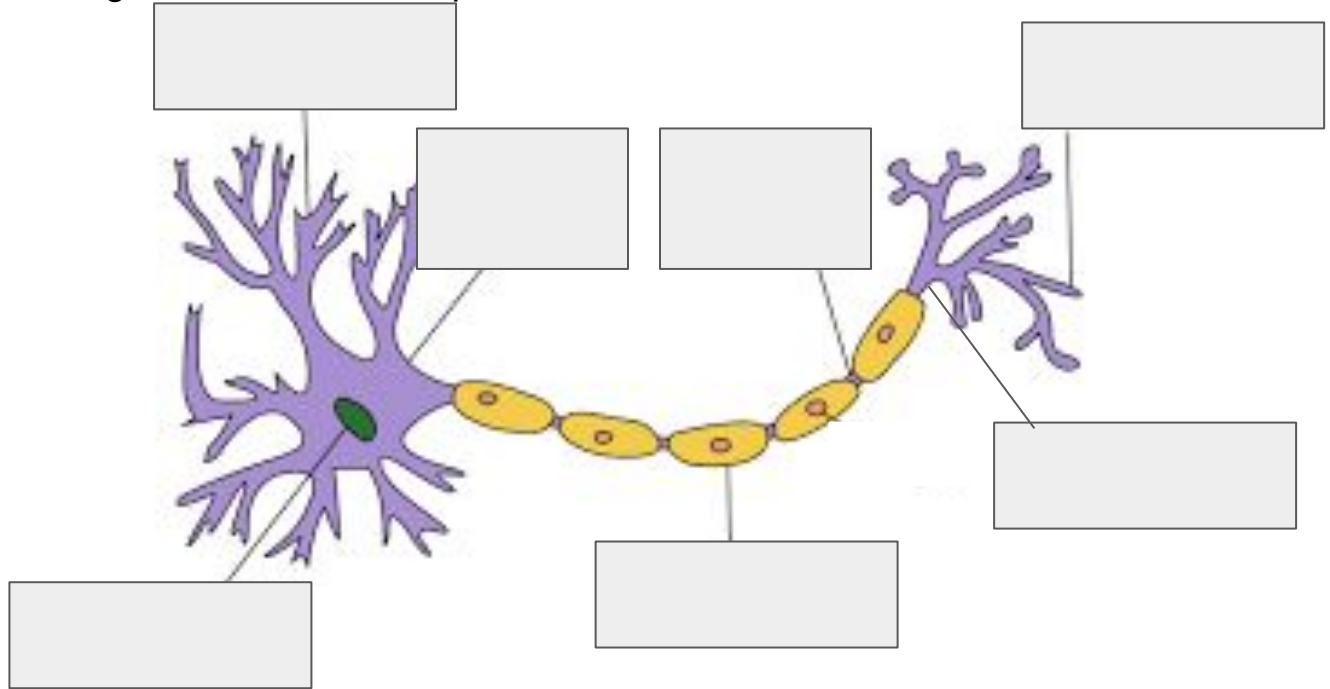
Structure of the mitochondrion	Main Function
cristae	
inner matrix	
smooth outer membrane	

Motor Neuron

4.1.1 - Label a diagram of a motor neuron.

Define a motor neuron: _____

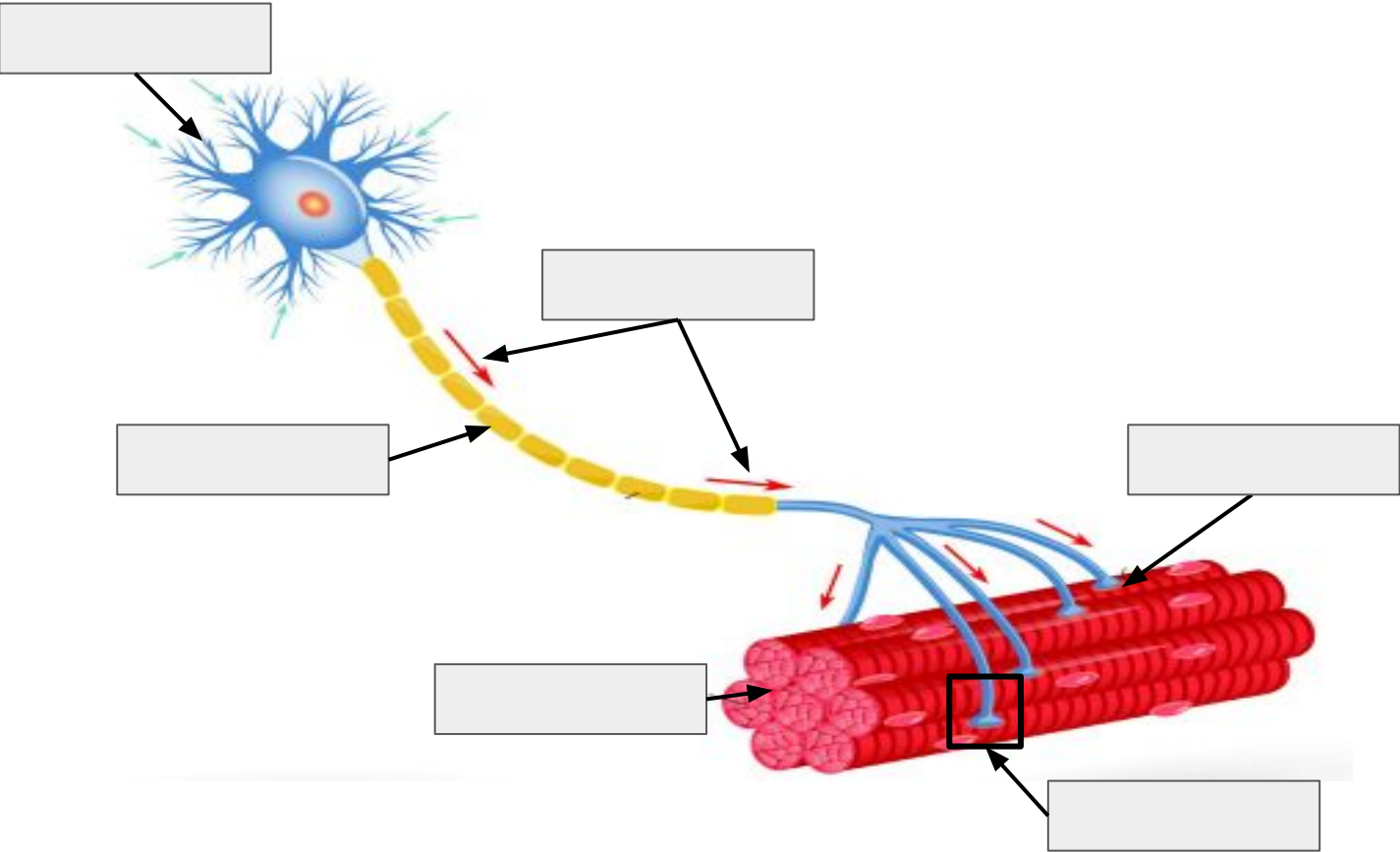
Label the diagram below and complete the chart.



Structure	Function
dendrite	
cell body	
nucleus	
axon	
axon terminal	
myelin sheath	
nodes of Ranvier	

Motor Unit

4.1.1 - Label a diagram of a motor neuron.



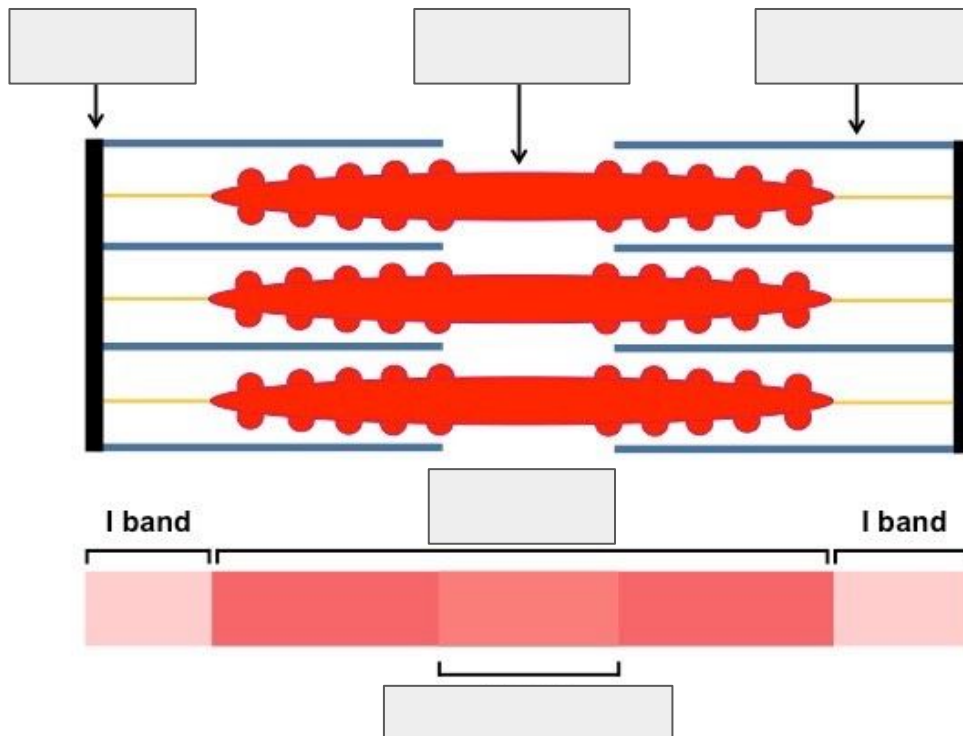
Structure	Function
dendrite	
axon	
motor end plate	
synapse	
muscle fiber (myofibril)	
action potential	

Sarcomere

(single contracting unit of a muscle fiber)

4.1.3 - Explain how skeletal muscle contracts by the sliding filament theory.

Label the sarcomere (thick black line to thick black line) below with the words from the chart. **Define** each term in the chart.



Structure	Function
sarcomere	
actin filament	
myosin filament	
H zone	
A band	
Z line/disc	