

Name: \_\_\_\_\_

Class: IB SEHS 2021 (HL)

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# IB SEHS

# Summer Warm-Up



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# Introduction and Note to Students

Dear Future SEHS Student,

Welcome to IB Sports, Exercise, and Health Sciences. In this class, we will be learning all about the human body and how it functions through the lens of movement, sports and exercise. We cover topics related to anatomy, the cardiovascular system, energy systems, movement analysis, skill in sport, sport psychology, measurement and evaluation of sport science.

The content in SEHS is really interesting and sometimes challenging! In an effort to maximize the time we have to engage in active practice - you have the task of learning the basic structures and functions you will be responsible for knowing in SEHS. The majority of this is plain old memorization - not the most fun, but very necessary!

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

If you have any questions or concerns, please email me at [strowe@crec.org](mailto:strowe@crec.org) or send me a Schoology message.

I look forward to having you in class next year!

Have a great summer,

A handwritten signature in black ink that reads "Stacy J. Rowe". The signature is written in a cursive, slightly slanted style.

# Anatomical Position Diagram

Draw the **anatomical starting position**. Draw both the front and back of the body.

# Anatomical Position

## Key Terms

**1.1.5 Apply** the anatomical terminology to the location of bones.

<b>Anatomical Position Term</b>	<b>Definition</b>	<b>Use the term in a sentence to compare the location of 2 different bones</b>
Inferior		Example: The lumbar spine is inferior to the thoracic spine
Superior		
Proximal		
Distal		
Medial		
Lateral		
Posterior		
Anterior		

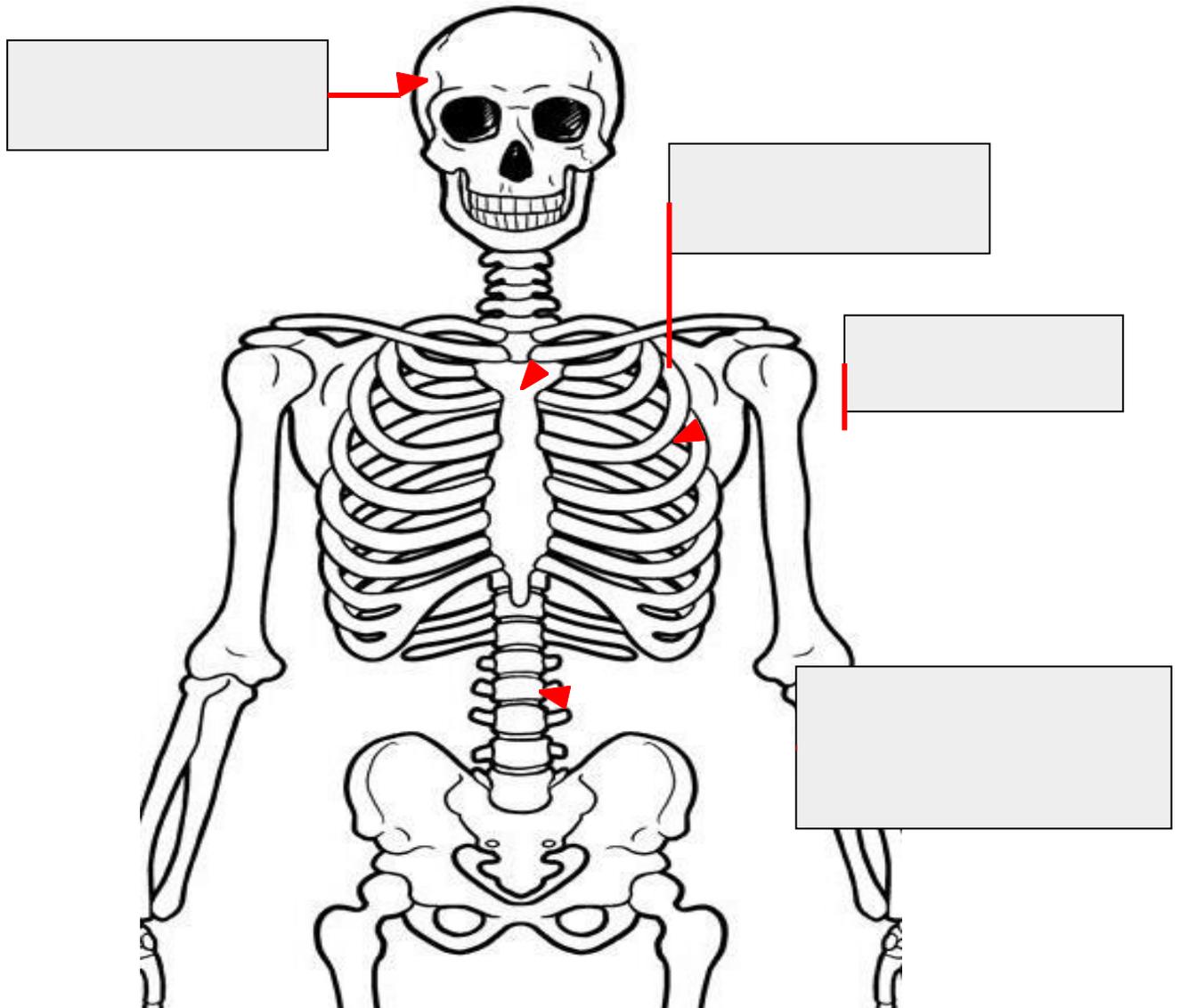
# Axial Skeleton Overview

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

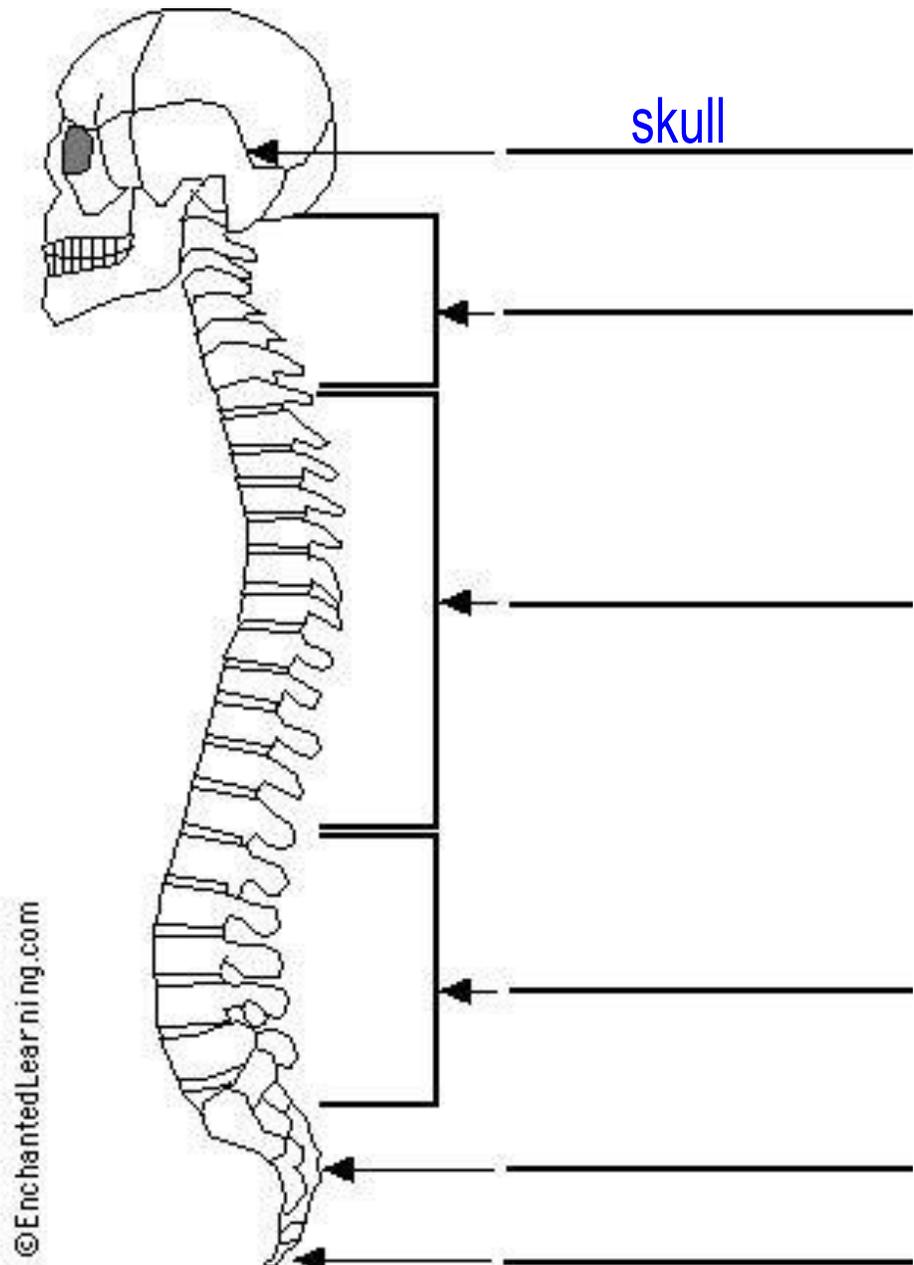
## Vertebral Column Detail

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)

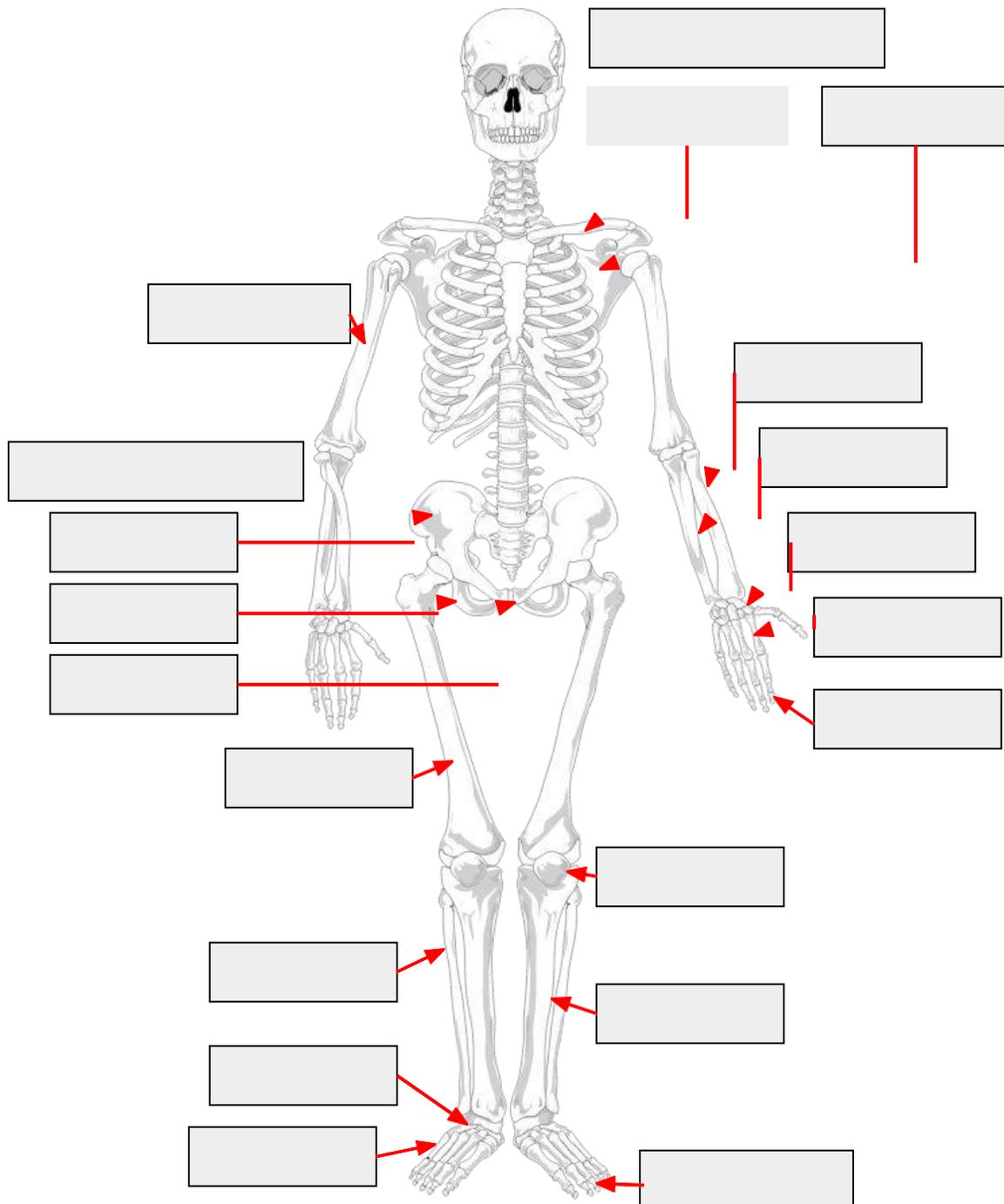


# Appendicular Skeleton

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)

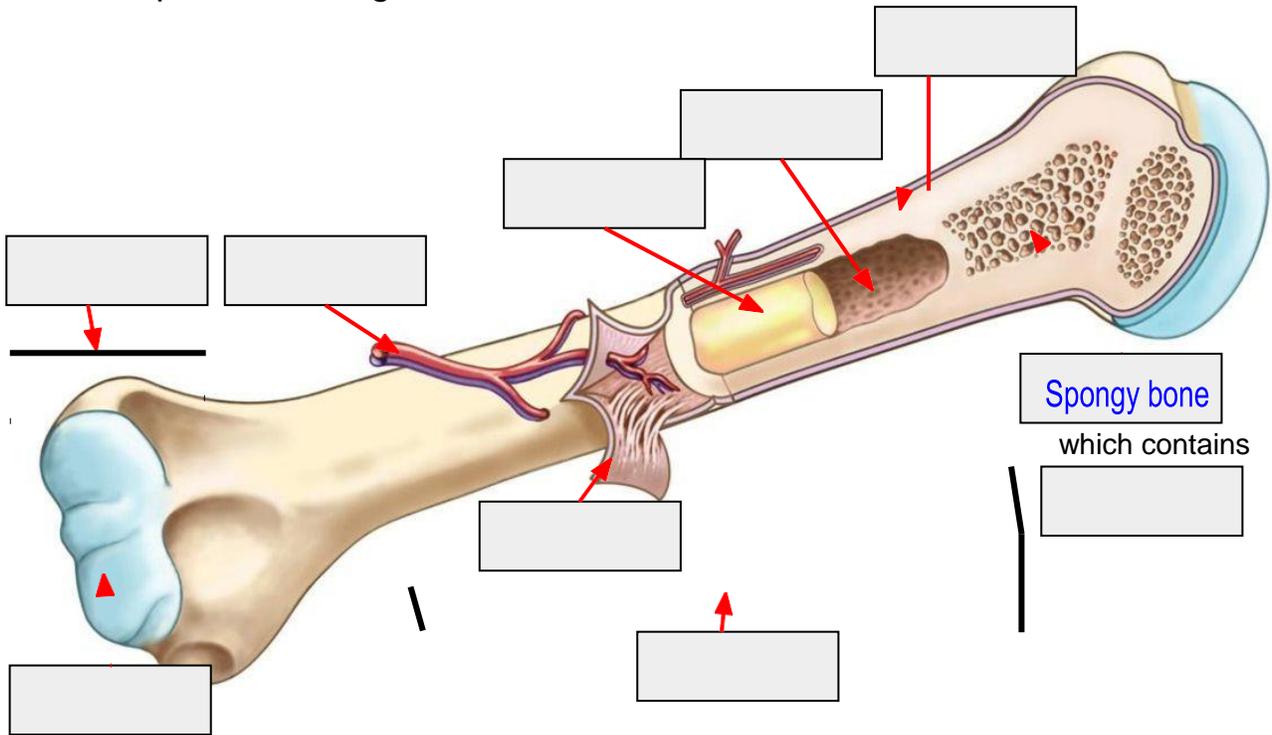
- |                                      |   |                                  |                                  |                                      |                                  |
|--------------------------------------|---|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| <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.

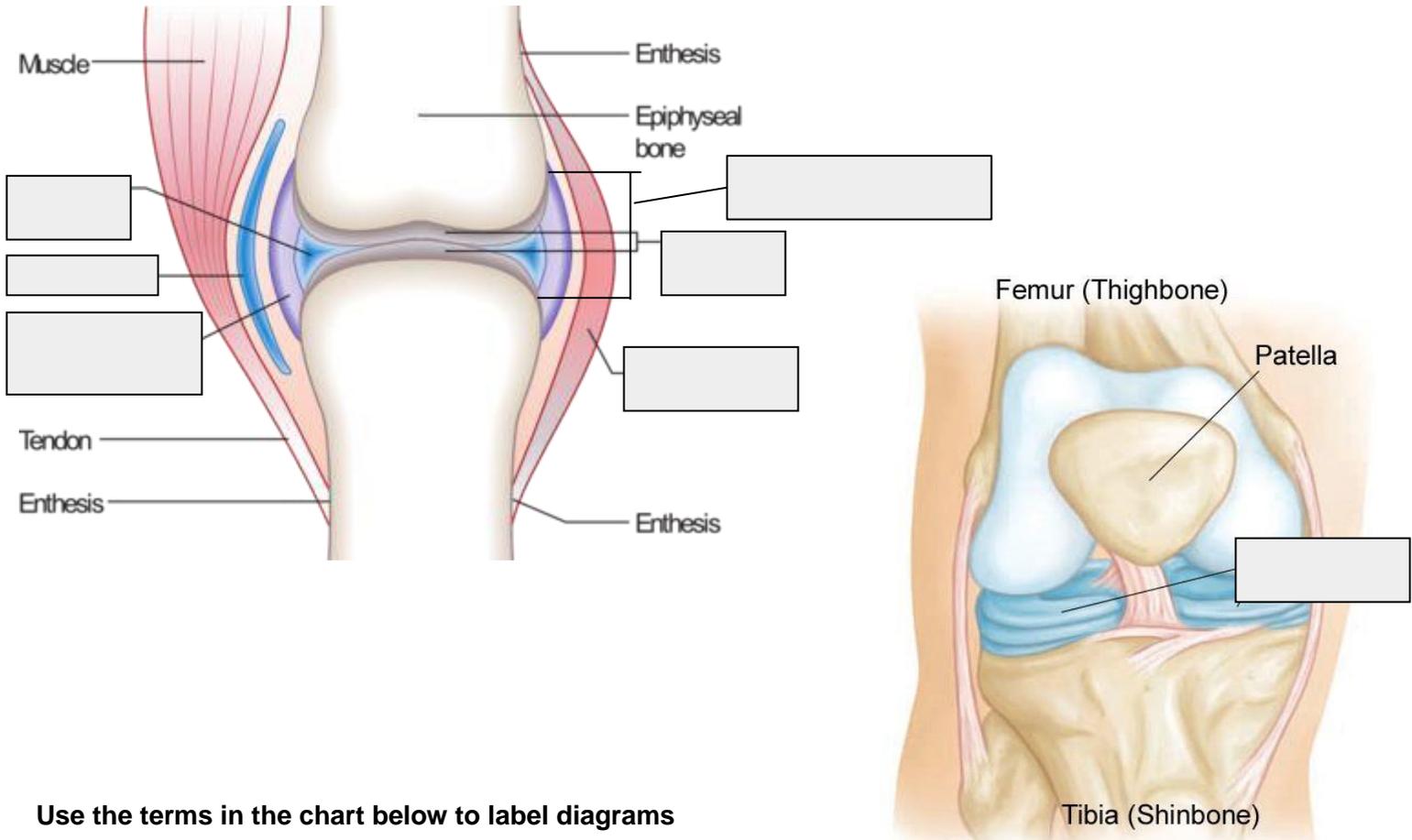
**Label** the diagram using the terms from the chart. Complete the chart with the functions of the different parts of a long bone.



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 joint.



Use the terms in the chart below to label diagrams

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

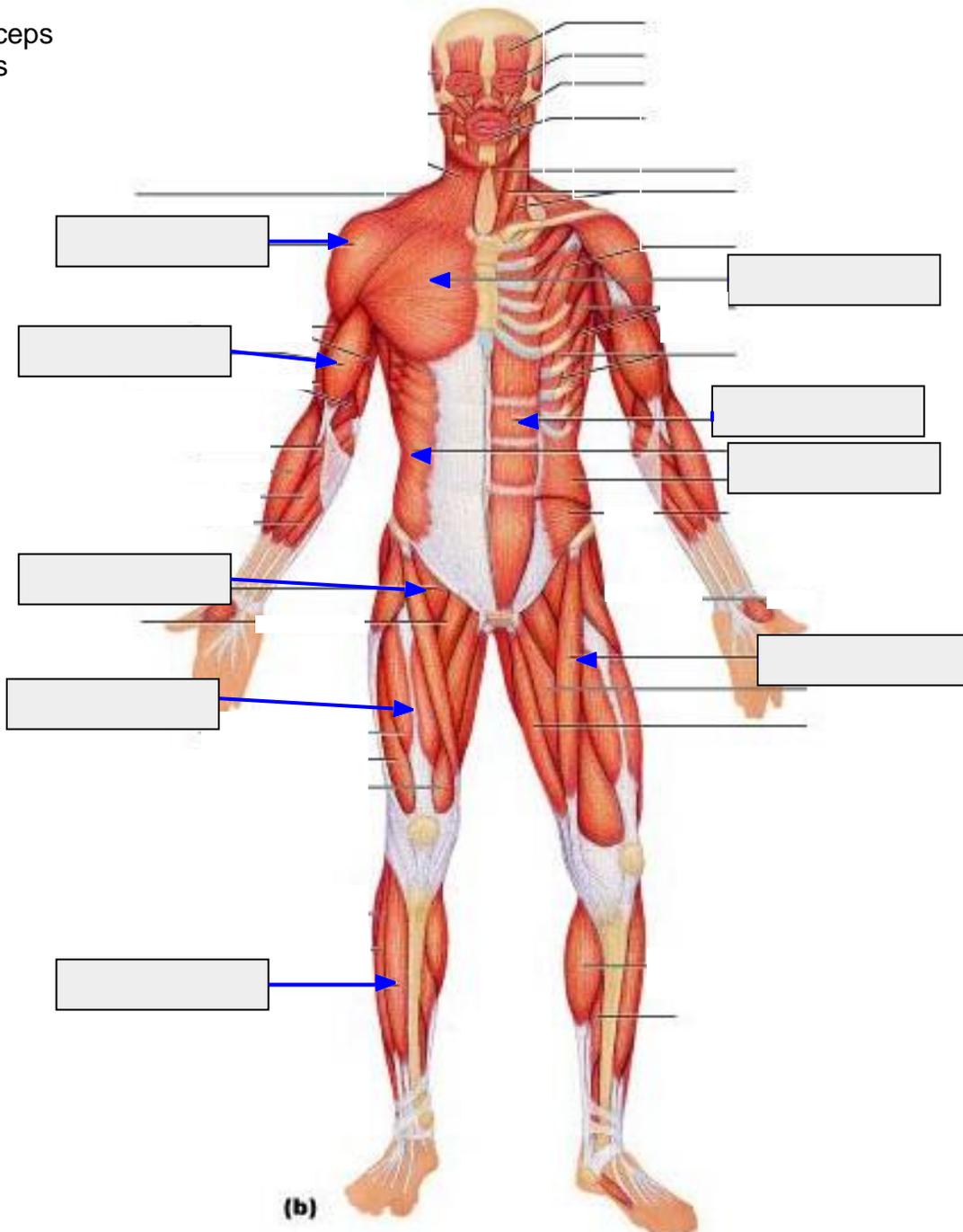
# Muscles of the Body

## 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
- rectus abdominus
- biceps brachii
- quadriceps femoris



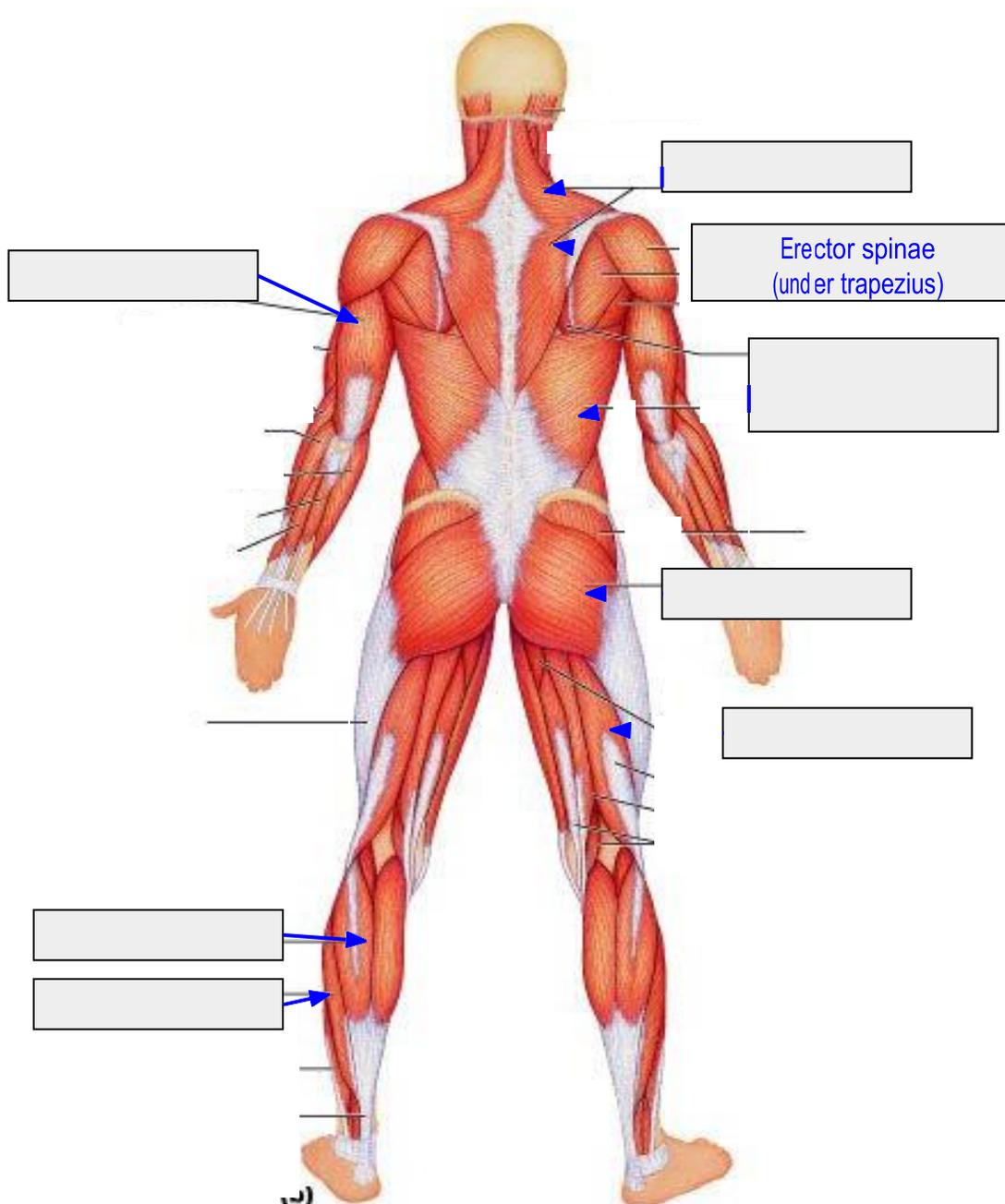
# Muscles of the Body

## 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      |



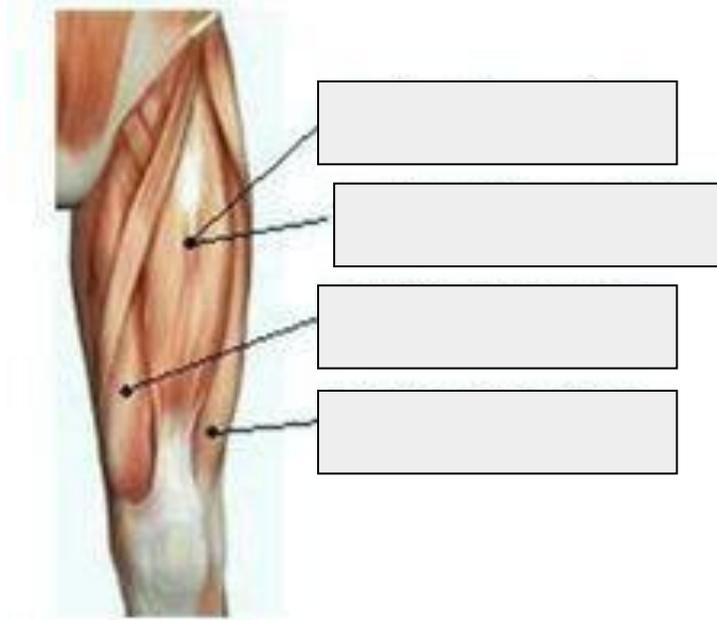
# Muscles of the Body

## Quadriceps and Hamstring

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

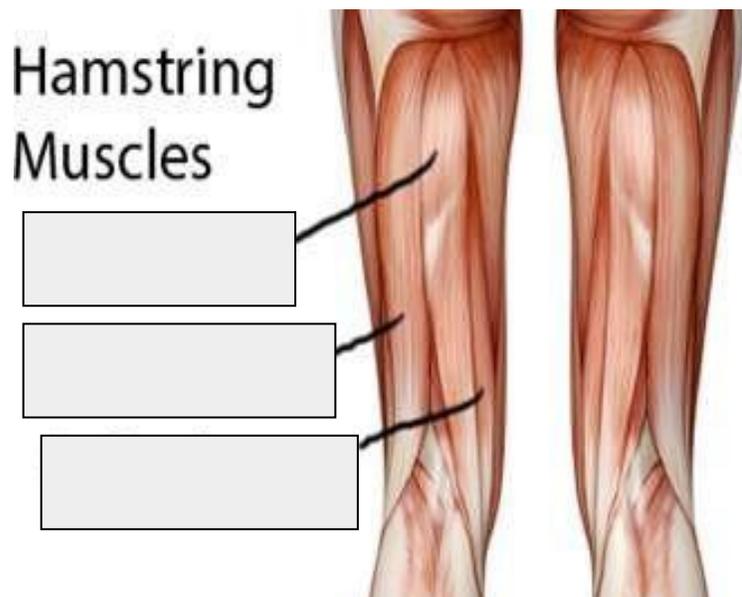
The **quadriceps** femoris is a group of 4 muscles that make up your anterior thigh. **Label** the *anterior* closeup of the *quadriceps* below.

- 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 Structure

1.2.3 - Annotate the structure of skeletal muscle

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

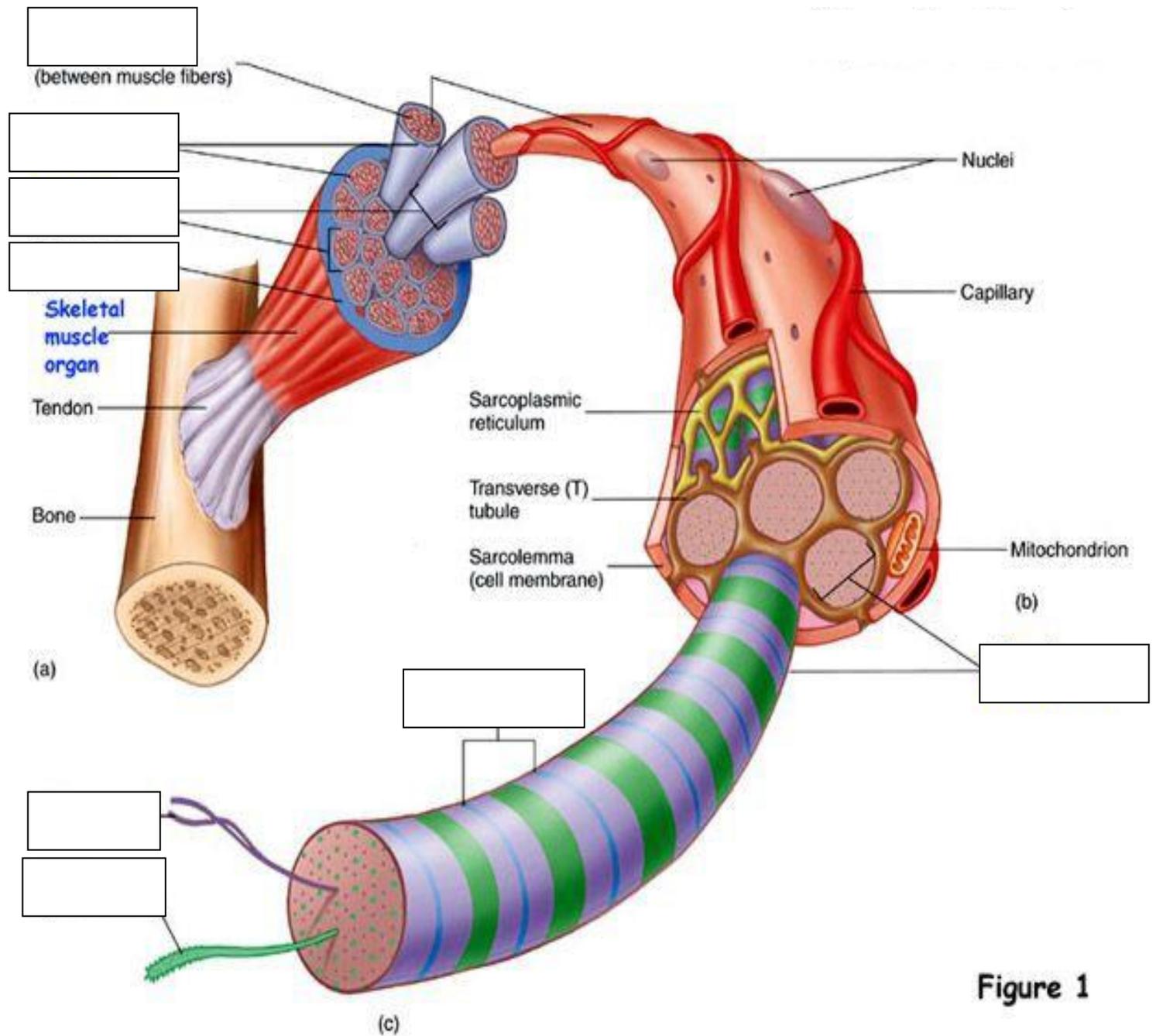


Figure 1

# Skeletal Muscle Structural Hierarchy

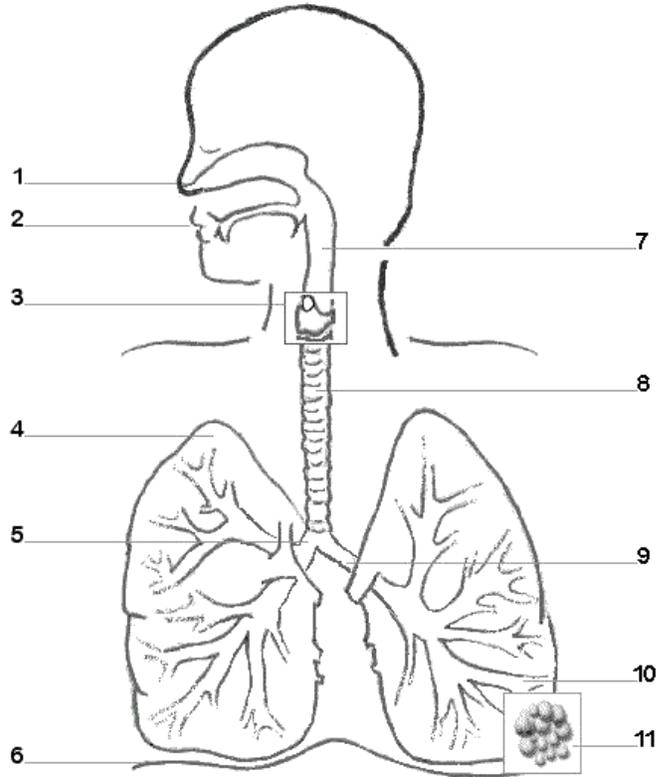
1.2.3 - **Annotate** the structure of skeletal muscle

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

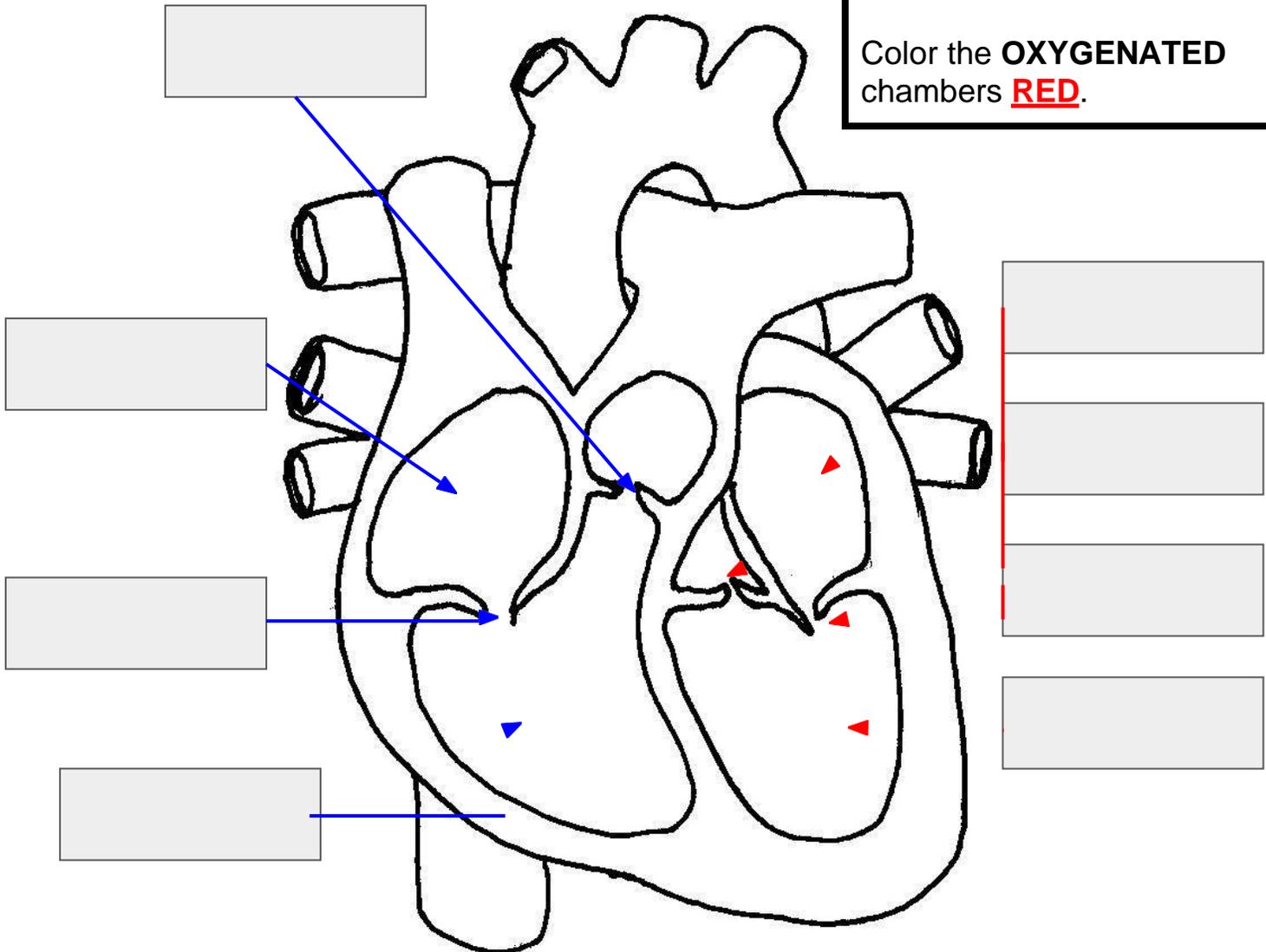
- Right Atrium
- Left Atrium
- Right Ventricle
- Left Ventricle

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.

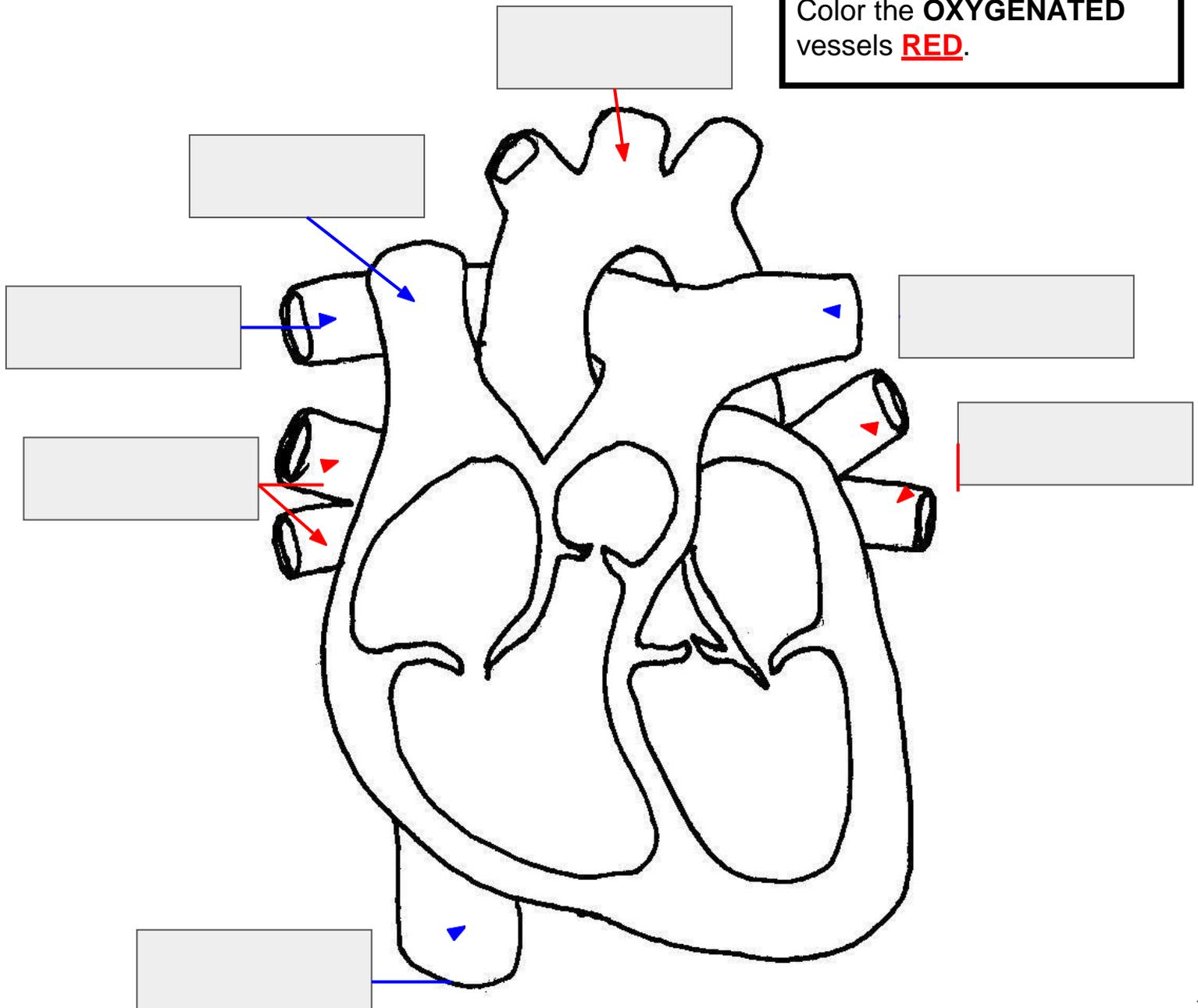
**Label and color the diagram below**

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**.

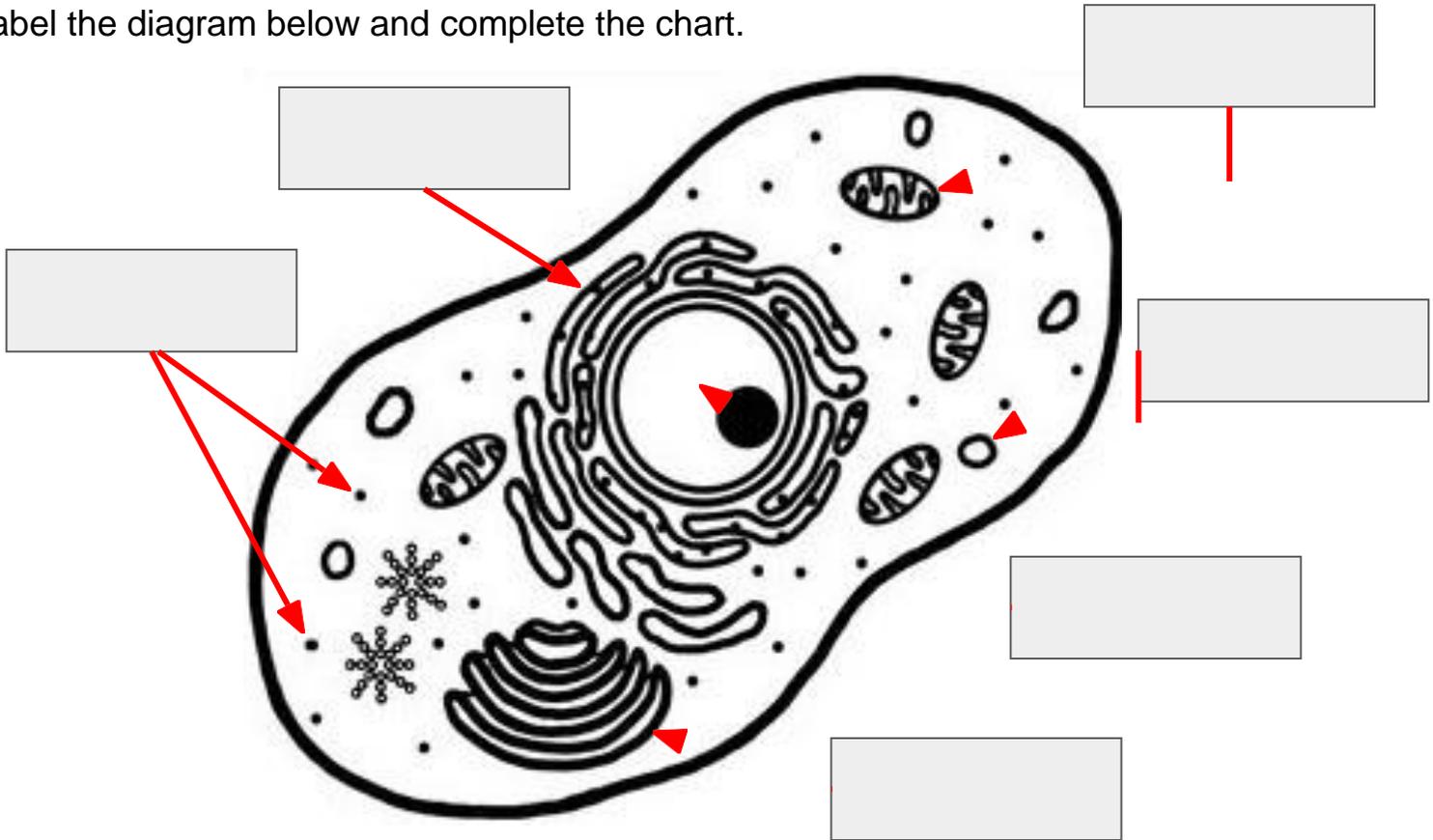
Color the **OXYGENATED** vessels **RED**.



# Animal Cell Ultrastructure

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

Label the diagram below and complete the chart.

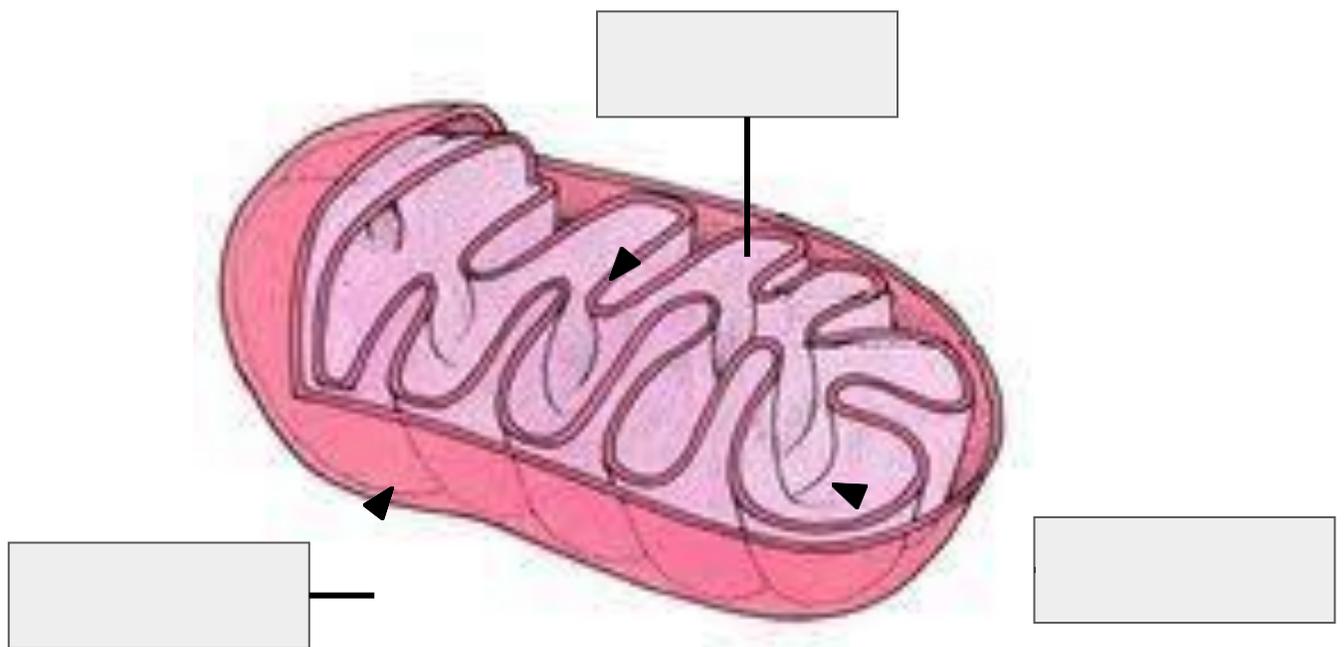


Organelle	Main Function
ribosomes	
rough endoplasmic reticulum	
lysosomes	
Gogli apparatus	
mitochondrion	
nucleus	

# Mitochondrion Ultrastructure

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

Label the diagram below and complete the chart.



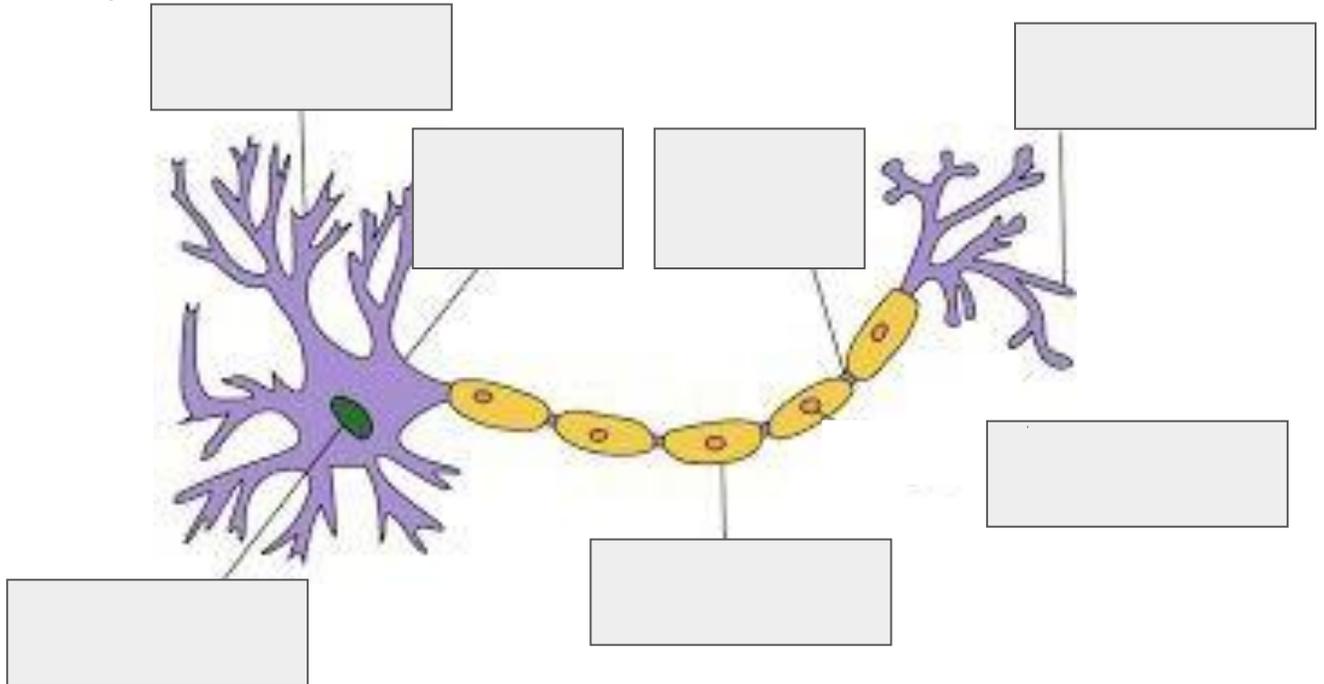
Structure of the mitochondrion	Main Function
cristae	
inner matrix	
smooth outer membrane	

# Motor Neuron

4.1.1 - Label a diagram of a motor neuron.

Define a motor neuron: \_\_\_\_\_

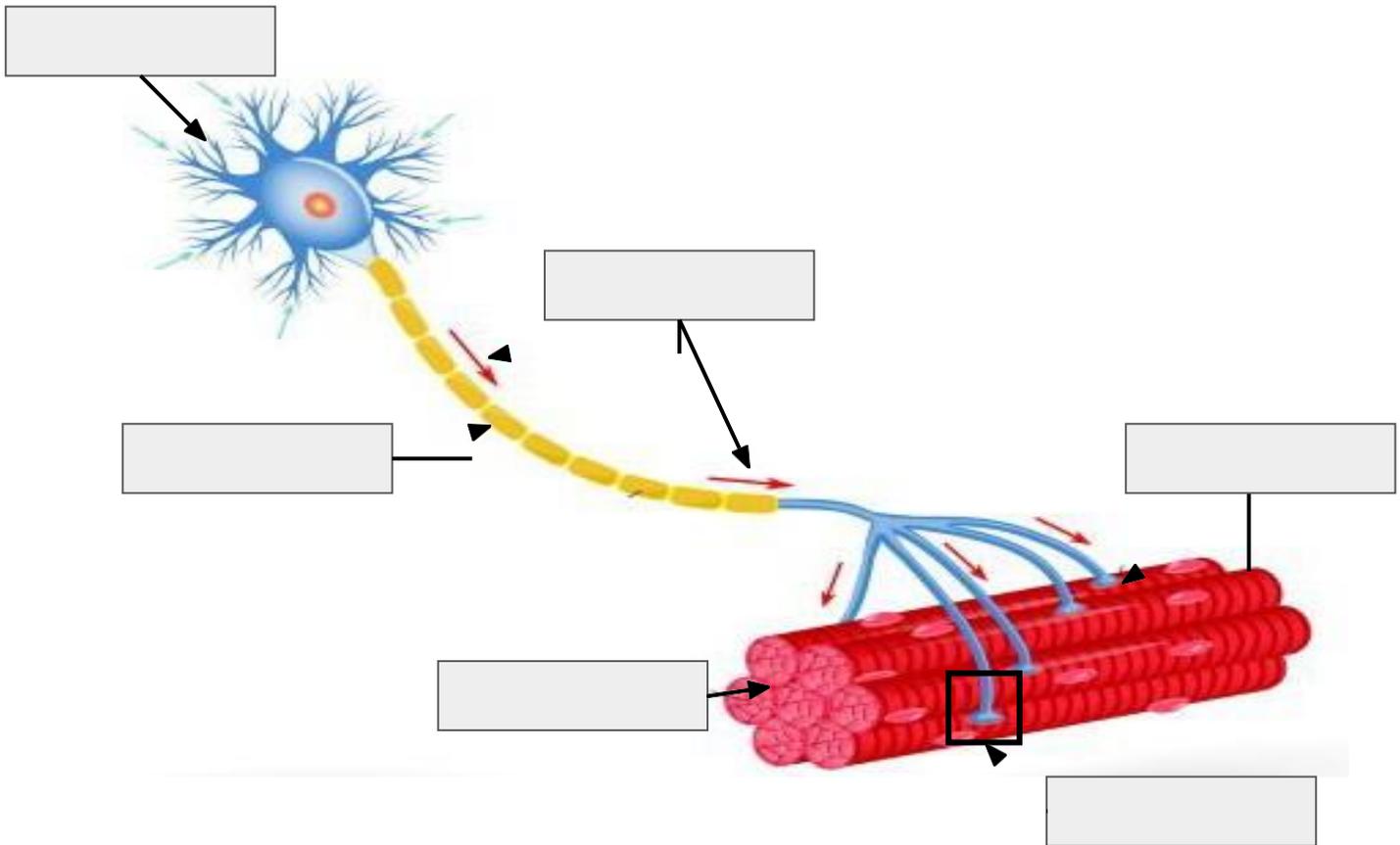
Label the diagram below and complete the chart.



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.



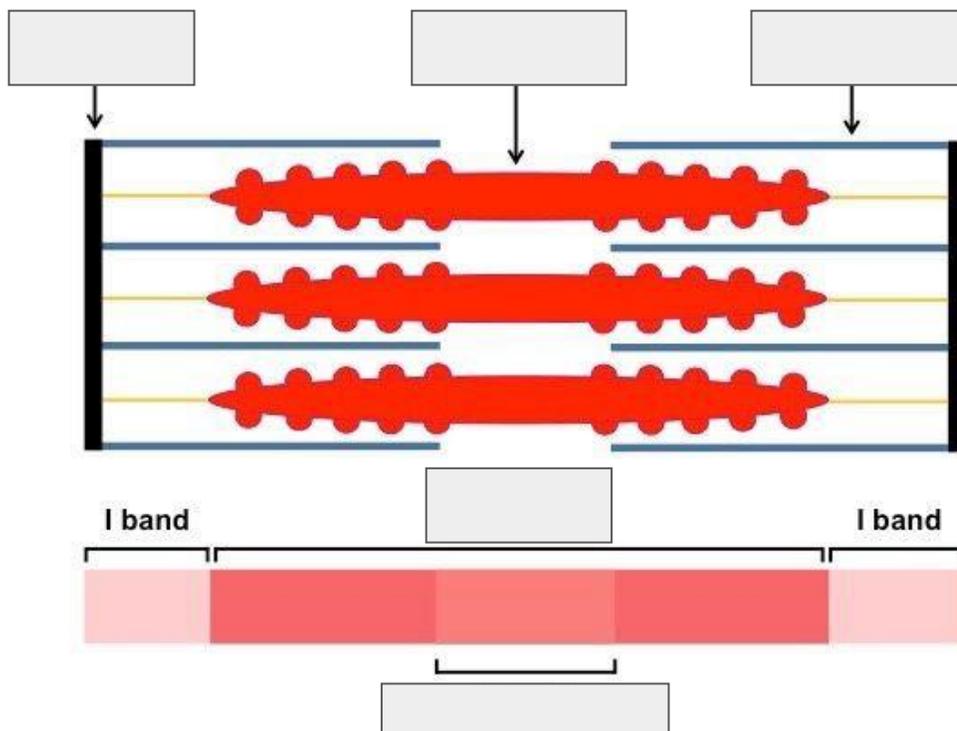
Structure	Function
dendrite	
axon	
motor end plate	
synapse	
muscle fiber (myofibril)	
action potential	

# 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	