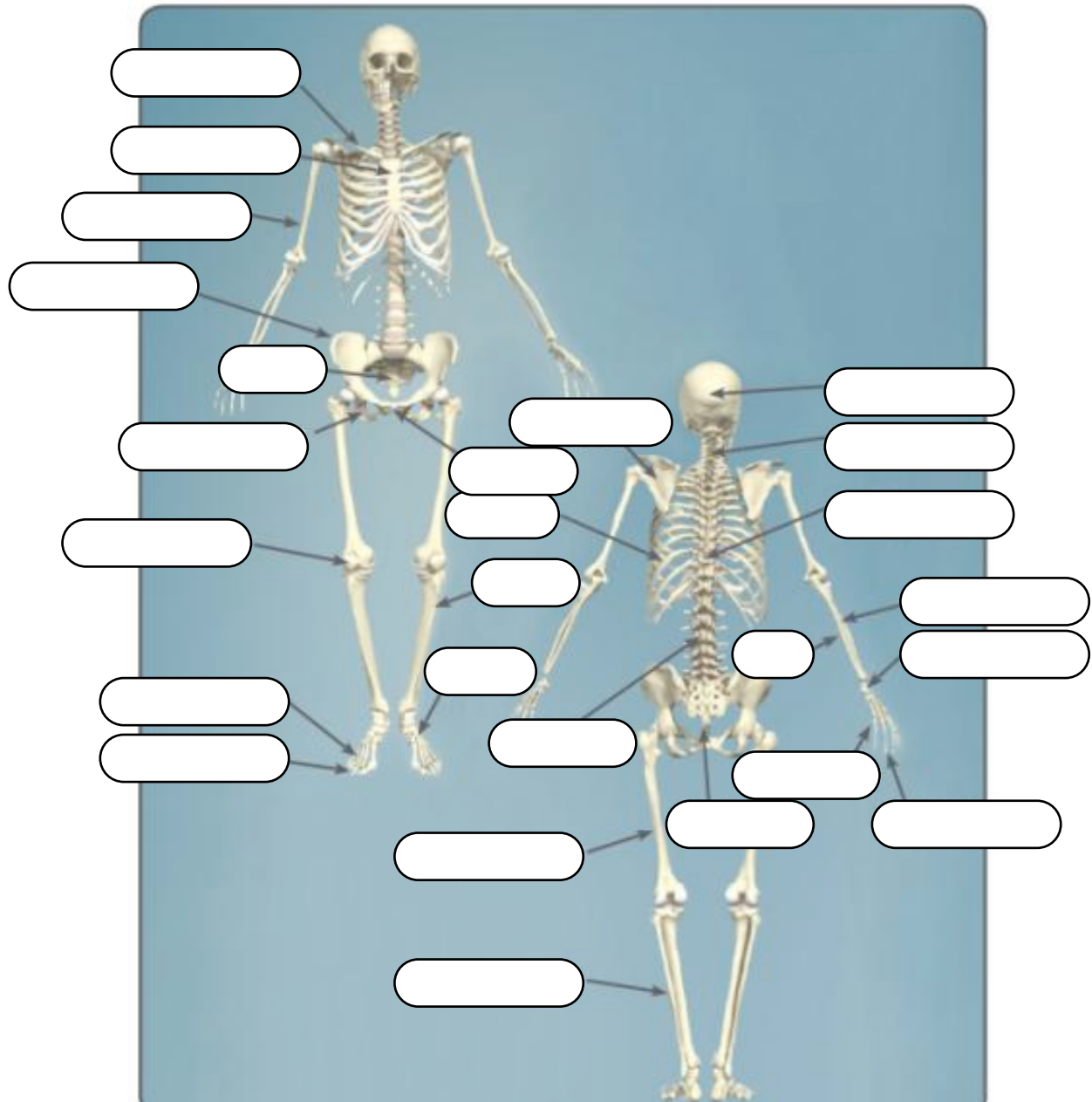




Anatomy and Physiology Workbook

LEARN - INSPIRE - SUCCEED

Label The Skeletal System

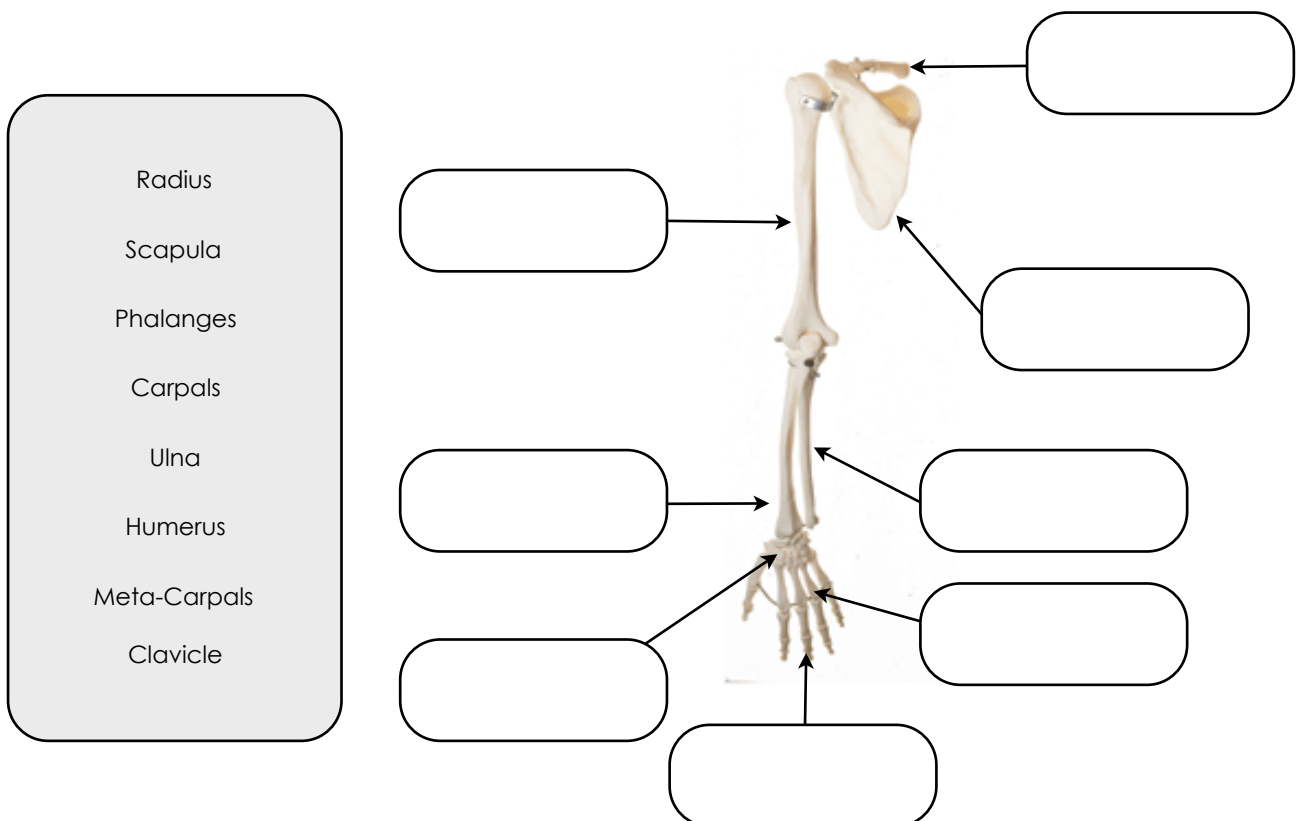
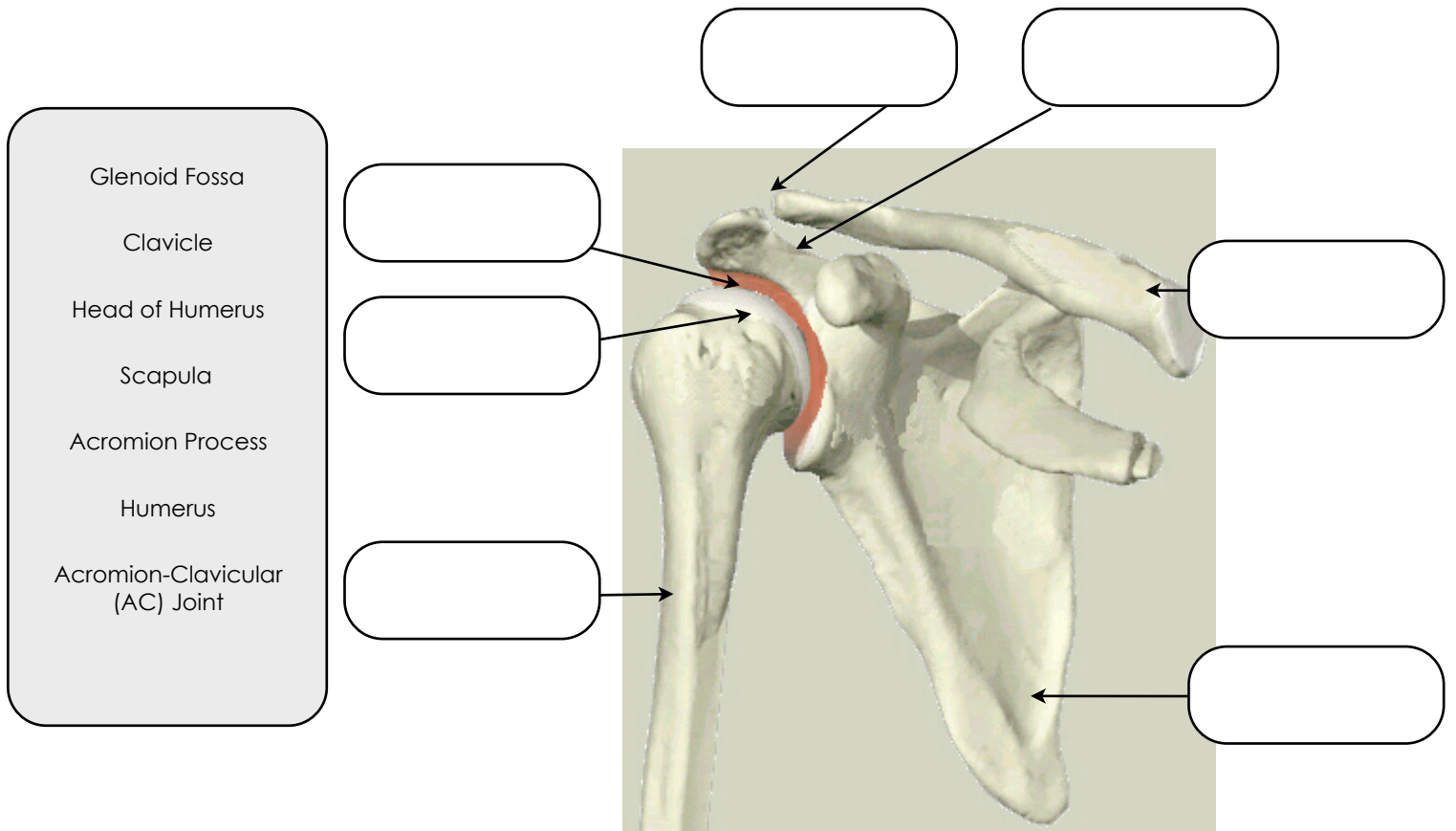


Fibula
Lumbar vertebrae
Patella
Sternum
Ilium
Femur
Scapula
Phalanges
Sacrum
Ischium

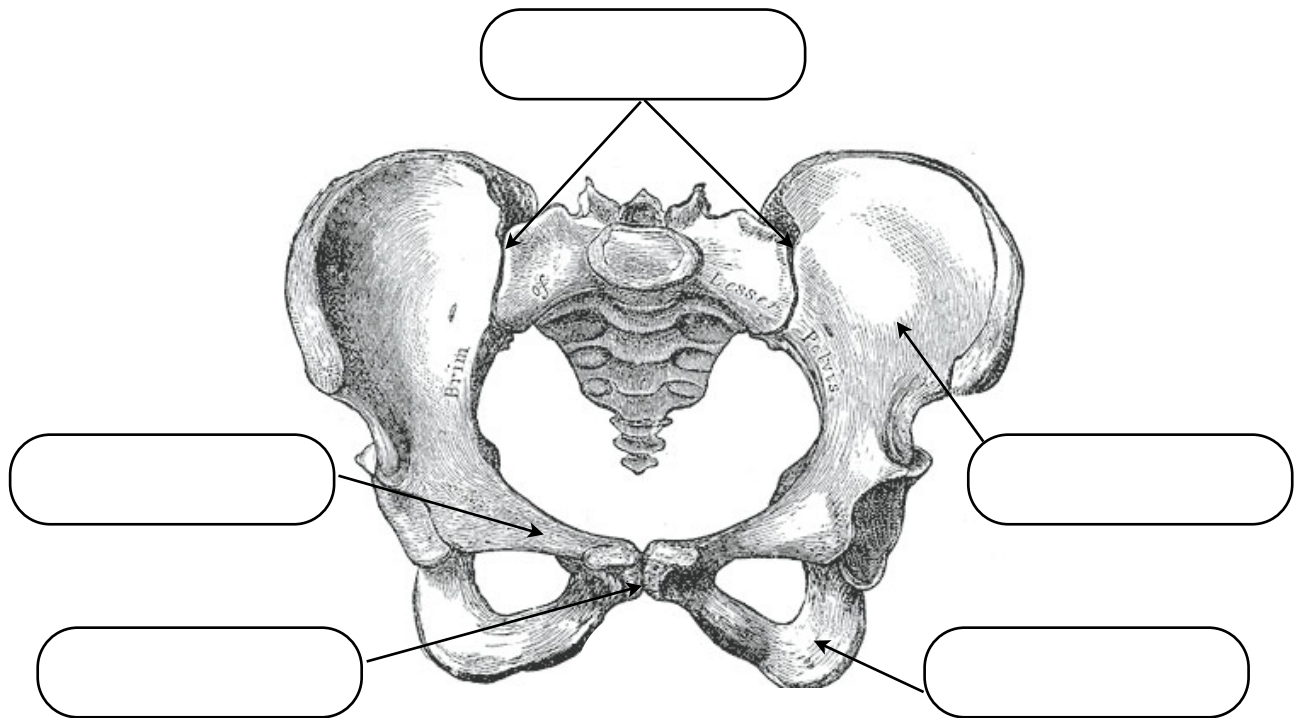
Tarsals
Cranium
Clavicle
Pubis
Ribs
Cervical vertebrae
Radius
Metacarpals
Humerus
Carpals

Metatarsals
Tibia
Thoracic vertebrae
Ulna
Femur
Coccyx

Label The Shoulder Girdle and Upper Limb



Label The Pelvic Girdle



- Pubic Symphysis

- Ilium

- Pubis

- Sacroiliac Joint

- Ischium

What are the three main differences between the male and female pelvic girdles?

1: _____

2: _____

3: _____

Label and describe each section of the Vertebral Column



The diagram shows a lateral view of the human vertebral column, color-coded by region: cervical (pink), thoracic (green), lumbar (blue), and sacral (brown). Four callout boxes with arrows point to each region, each containing fields for Name, Number, and Characteristic.

Name: _____

Number: _____

Characteristic: _____

Name: _____

Number: _____

Characteristic: _____

Name: _____

Number: _____

Characteristic: _____

Name: _____

Number: _____

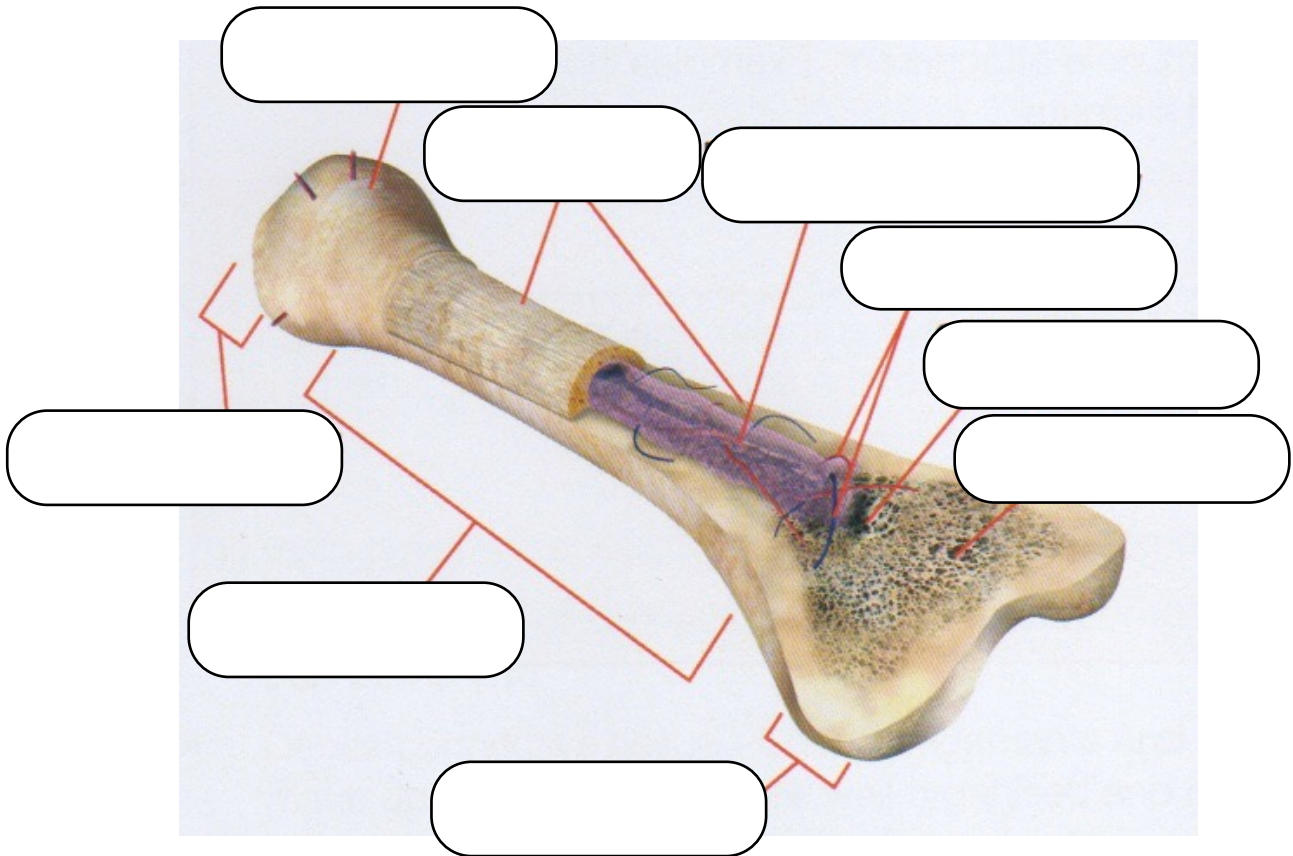
Name: _____

Number: _____

Which muscles are affected in someone who has a kyphotic posture?

Which muscles are affected in someone who has Lordosis?

Label a Long Bone



Capillaries
Periosteum
Diaphysis
Spongy bone (Cancellous)

Bone cavity (containing bone marrow)
Epiphysis x 2
Compact bone
Growth plate

What is the term used to describe bone growth?

Which minerals are laid down on cartilage to build bone?

Osteoblasts and Osteoclasts, which build up bone and which break down bone?

Fill in the blanks to describe the process of bone growth:

The process of bone formation is known as _____, it begins during the early stages of _____ through to childhood. It is the replacement of _____ with bone and is done by using bone building cells known as _____.

The growth of hyaline cartilage produces a matrix of protein filaments, into which osteoblasts deposit _____ and _____. This forms a thin layer of compact bone creating the _____ and giving the bone its length. The compact bone is deposited layer upon layer, with the outer layer producing the _____.

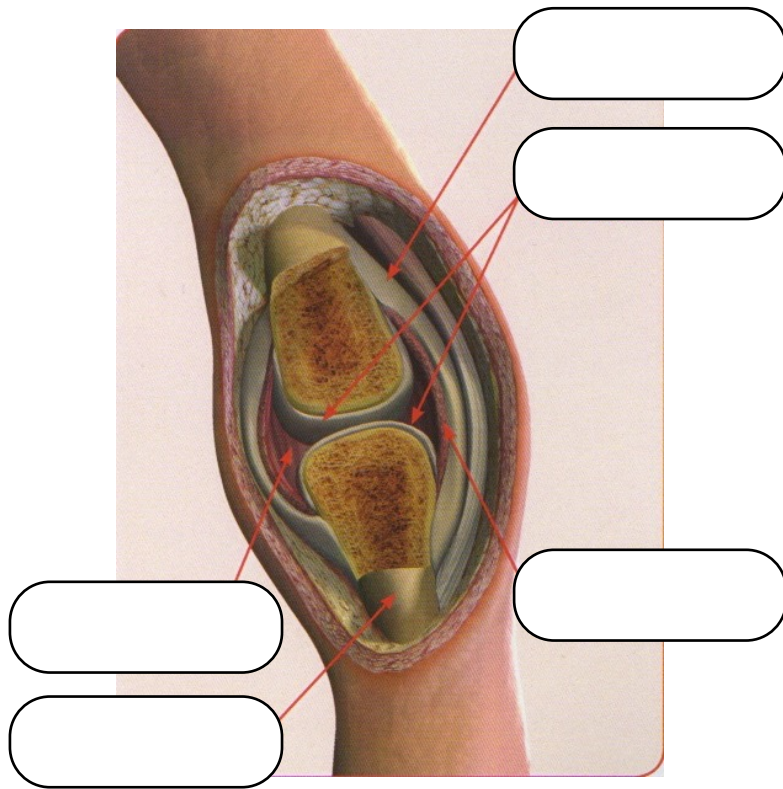
To balance bone growth and to prevent the bone becoming too thick, _____ remove any excess bone. At the time of birth, the osteoblasts isolate the rounded end of the bone known as the _____ by forming a _____ at the end of the diaphysis. This is the only part of the bone which remains as cartilage and is responsible for the growth in length and shape of the bone, turning to bone itself by adulthood when growth is no longer possible.

The type of bone laid down at the diaphysis is known as _____ bone, a different type of bone known as _____ bone is formed at the epiphysis.

Give two examples of each bone type and describe their characteristics and purpose

Bone Type	Example	Characteristics
Long bones		
Short bones		
Flat bones		
Irregular bones		
Sesamoid bones		

Label a Synovial Joint



Synovial membrane

Periosteum

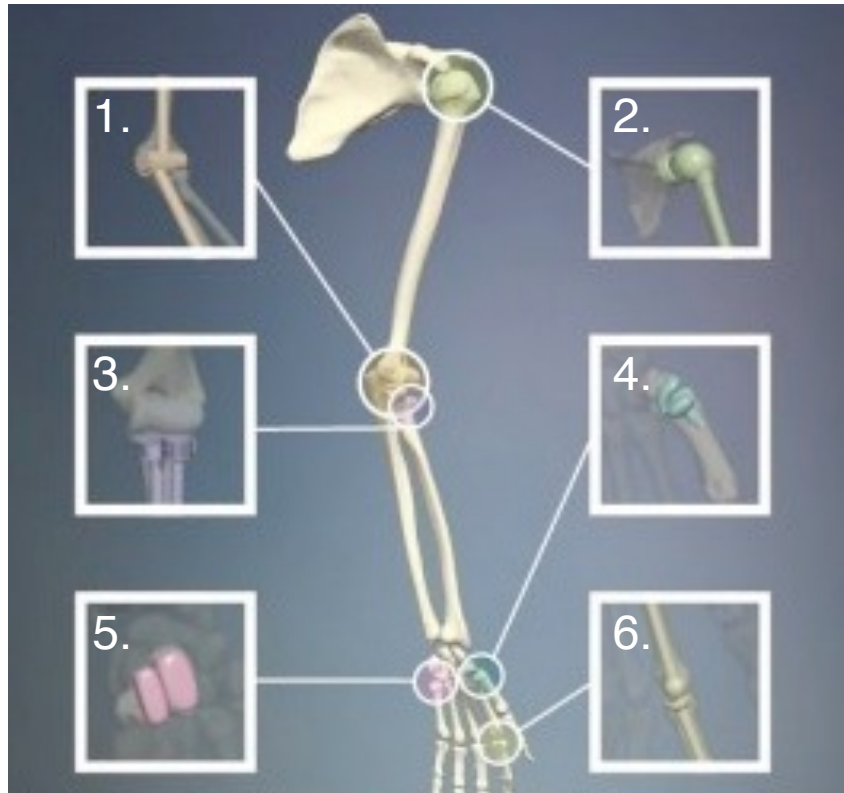
Ligament

Synovial fluid

Articular cartilage

Label each synovial joint and describe the movement potential at each one.

Hinge Joint
Ball and Socket
Gliding Joint
Saddle Joint
Pivot joint
Condylloid joint



1. Type of Joint?

Movement Potential? _____

2. Type of Joint?

Movement Potential? _____

3. Type of Joint?

Movement Potential? _____

4. Type of Joint?

Movement Potential? _____

5. Type of Joint?

Movement Potential? _____

6. Type of Joint?

Movement Potential? _____

Complete the following table for Joint Movement

Exercise	Joints Used, Joint Type and Action	Plane of Movement	Agonist and Antagonist
Bicep Curl			
Squat			
Side Lat Raise			
Forward Lunge			
Standing Shoulder Press			
Seated Chest Press			
Lat Pulldown			

Label the Muscular System:

Anterior -



Posterior -



Erector Spinae
Trapezius
Tibialis Anterior
Biceps
Latissimus Dorsi
*Hamstrings
*(name each one)

Triceps
Iliopsoas
Soleus
Internal and External Obliques
Deltoid
*Quadriceps
*(name each one)

Rhomboids
Abductors
Gastrocnemius
Gluteus Maximus
Rectus Abdominus
Brachialis
Transverse Abdominus

Learning Origin and Insertion: Sometimes you just have to write it down:

Muscle Name	Origin	Insertion	Joint(s) crossed	Joint action when muscle contracts
Shoulder Girdle:				
Trapezius		Spine of scapula and lateral edge of clavicle		
Rhomboids	C7 and T1 - T5		Shoulder girdle	
Levator scapulae		Inner edge of scapula		
Serratus anterior	Ribs 1-8			Protraction of scapula
Pectoralis minor	Ribs 3-5			
Shoulder Joint:				
Deltoid		Half way down the lateral edge of the humerus		
Pectoralis major			Shoulder	Shoulder horizontal flexion, adduction and medial rotation
Latissimus dorsi	Lower 3-4 ribs, bottom of scapula, via TLF - T6-T12, lumbar and sacral vertebrae, iliac crest			
Teres major		Humerus		

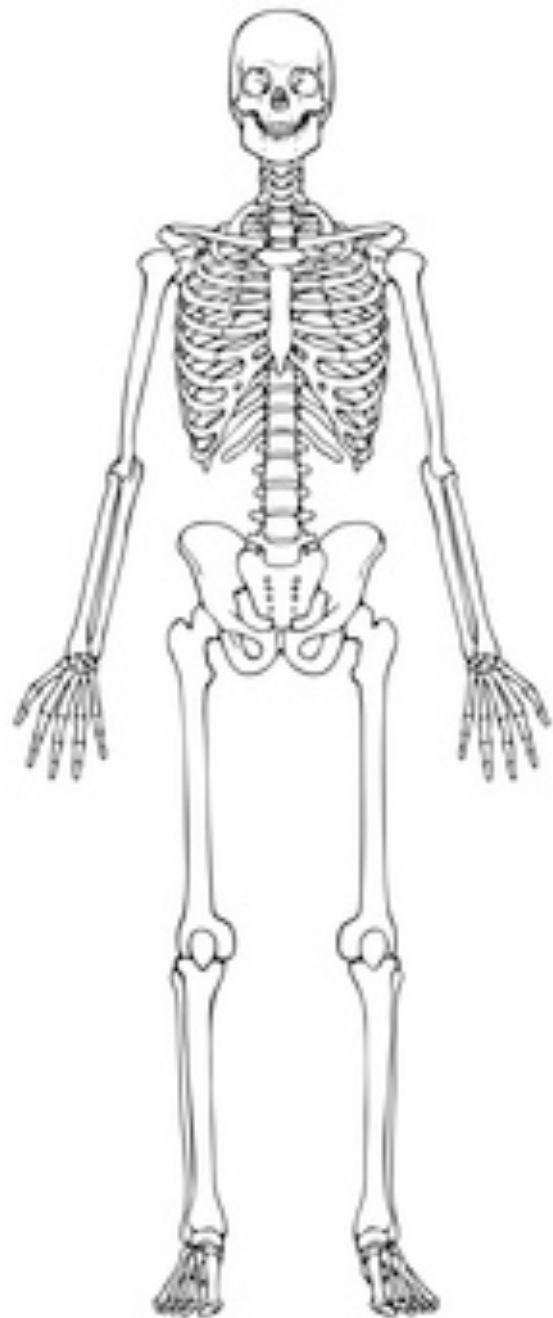
Muscle Name	Origin	Insertion	Joint(s) crossed	Joint action when muscle contracts
Rotator Cuff:				
Supraspinatus		Top lateral part of humerus		Abduction of humerus
Infraspinatus	Scapula			
Subscapularis			Shoulder	Medial rotation of humerus
Teres minor	Scapula			
Muscles of the elbow:				
Biceps brachii			Shoulder and elbow	
Brachialis		Top of ulna	Elbow	
Brachioradialis				Flexion when the forearm is semi-pronated
Triceps brachii		Olecranon of ulna		
Muscles of the vertebral column:				
Illiocostalis	Ribs and iliac crest		Vertebrae	
Longissimus	Cervical, thoracic and lumbar vertebrae	Superior vertebrae to origin		
Spinalis	Cervical, thoracic and lumbar vertebrae			Extends the spine
Quadratus lumborum		L1-4 and bottom of 12th rib		
Multifidus	Transverse processes of vertebrae		Vertebrae	

Muscle Name	Origin	Insertion	Joint(s) crossed	Joint action when muscle contracts
Anterior abdominal wall muscles:				
Rectus abdominus			Lumbar and thoracic vertebrae	
External obliques		Linea alba and iliac crest		
Internal obliques	Thoracolumbar fascia and iliac crest			
Transverse abdominus	Lumbar fascia, iliac crest and cartilage of lower ribs			
Hip and Pelvic girdle:				
Iliacus	Ilium			
Psoas major	T12 and lumbar vertebrae			
Sartorius	Iliac spine	Tibia		
Tensor fascia latae	Outer edge of iliac crest			
Piriformis		Top of femur, greater trochanter		
Adductor group; Longus, magnus, brevis	Pubis			Adducts hip
Pectineus		Posterior middle of femur	Hip	
Gracilis			Hip and knee	Assist hip and knee flexion and adducts hip
Gluteals / abductors	Ilium		Hip	

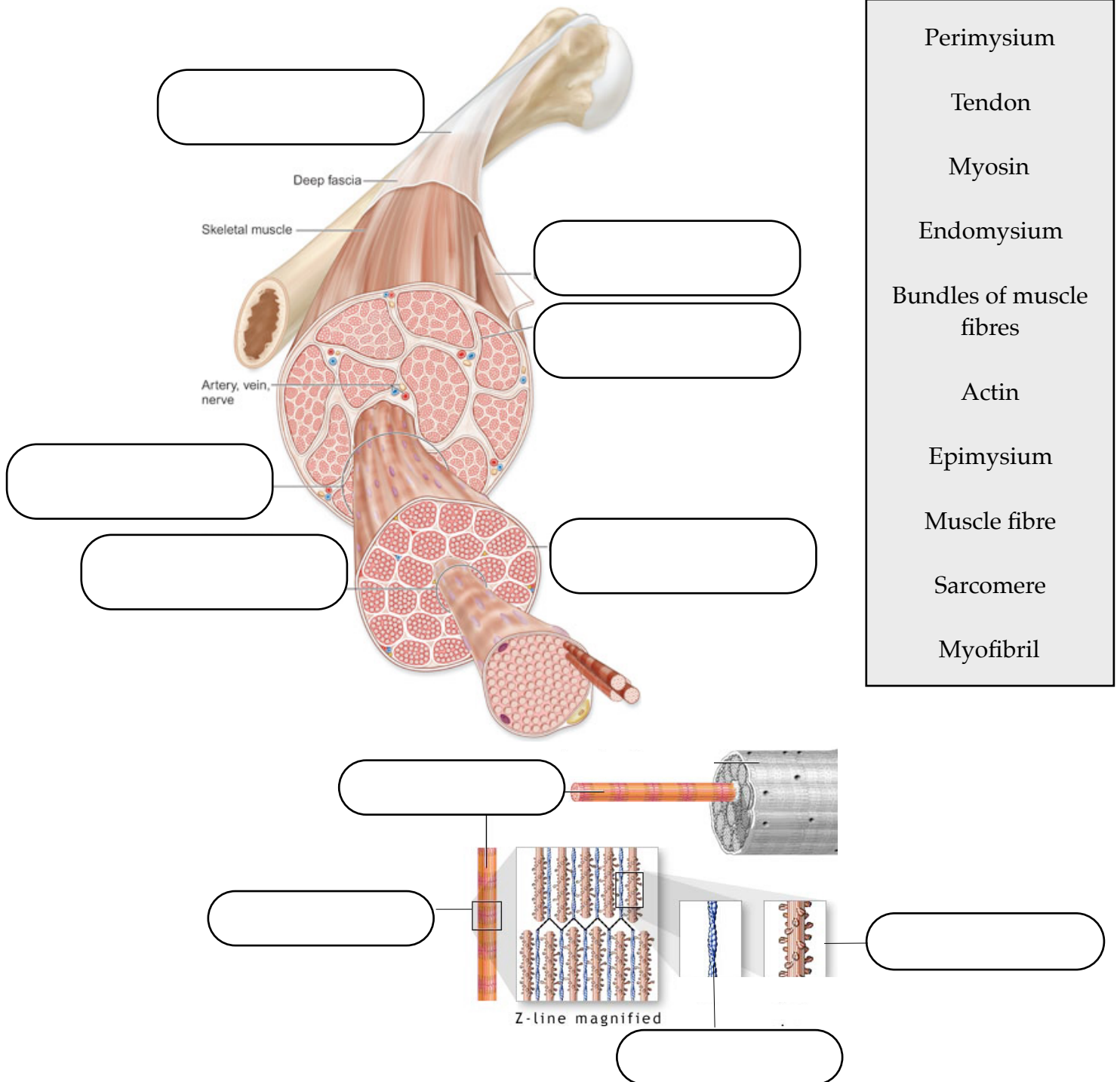
Muscle Name	Origin	Insertion	Joint(s) crossed	Joint action when muscle contracts
Muscles of the upper leg:				
Hamstrings; Bicep femoris, semimembranosus, semitendinosus				Knee flexion and extension
Quadriceps; Rectus femoris, vastus medialis, intermedius, lateralis		Front of tibia via patella tendon		
Muscles of the lower leg:				
Gastrocnemius	Femur			
Soleus	Tibia and fibula			
Tibialis anterior		Cuneiform bone and 1st metatarsal		

Build your own Muscle Man...

Using the origin and insertion of each of the main muscles, layer them on top of the skeleton diagram. Start with the deeper muscles first and layer up to the superficial muscles.



Label the Structure of Skeletal Muscle



Write down the location of each fascia

a. Endomysium _____

b. Perimysium _____

c. Epimysium _____

3. What is the unit of contraction called which contains the actin and myosin?

4. Where would you find smooth muscle, give two different places?

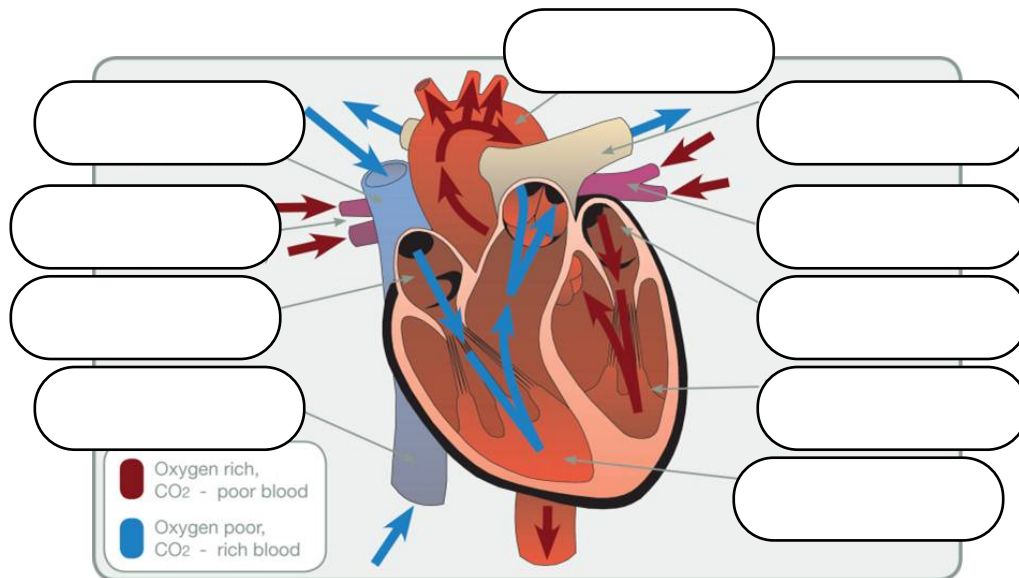
5. Define the sliding filament theory

6. Which of the three muscle types are striated in appearance?

7. What role does calcium play in muscle contraction?

8. Where does the energy source come from in muscle contraction?

Label The Heart



Left ventricle	Left Atrium
Inferior Vena Cava	Right Atrium
Superior Vena Cava	Pulmonary Artery
Aorta	(deoxygenated blood)
Right Venricle	
Pulmonary veins	
(oxygenated blood) x 2	

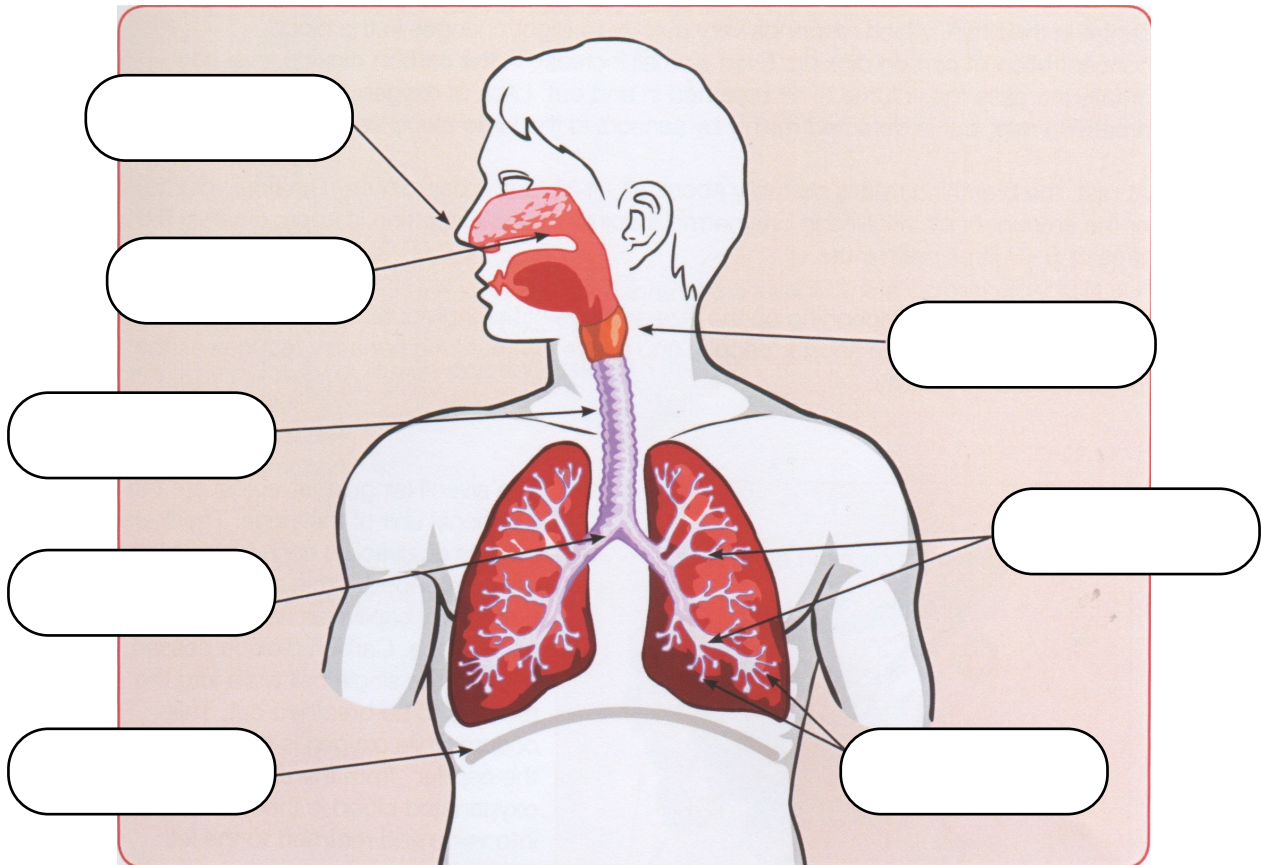
On your diagram, identify the location of the 4 non-return valves of the heart which prevent any back flow of blood...

What is 'Stenosis'? _____

What is the role of the 'Coronary arteries'? _____

Define blood pressure _____

Label The Respiratory System



Define the following:

Tidal Volume; _____

Residual Volume; _____

Vital Capacity; _____

Explain how oxygen enters the blood stream and what is this process called?

Write a flow chart that shows the complete route of inhaled Oxygen being delivered to the muscles, then the path of Carbon Dioxide going from the muscles back to being exhaled from the body (We have given you the first two):

Nose

Pharynx

Draw a diagram that shows the cycle of circulation ... Oxygen into lungs... oxygenated blood into heart... etc:

The energy systems

1. What is the energy currency that our body runs off?

2. Name the three energy systems and give an example gym activity for each one and state the duration it can last....

a.

b.

c.

3. The energy required to fuel our body comes from the food we eat, complete the following table which shows how the food we choose to eat influences the energy available in our energy stores to fuel activity...

Food type	Food source	Kcal per gram	RDA	How is it broken down, into what store
Carbohydrate				
Protein				
Fat				

4. What role would protein have if carbohydrates stores are depleted?

5. What element needs to be present to allow fat to be metabolised effectively and how would exercise help with this?

6. State how the Phosphocreatine system works and how can exercise adapt it to make it more efficient.....

7. State how the Lactic Acid system works and how can exercise adapt it to make it more efficient.....

8. State how the Aerobic system works and how can exercise adapt it to make it more efficient.....

Draw the structure of the nervous system:

What does ACE stand for?
