


# Level 2 Fitness Instructor – Anatomy and Physiology for Exercise

Full Name (Capitals)	
Course Start Date	
Course Location	
Tutor Name	


## Statement of Achievement

Assessor, by signing this statement of unit achievement you are confirming that all learning outcomes, criteria and range statements have been achieved under specified conditions and that the evidence gathered is authentic.

This statement of unit achievement table must be completed prior to claiming certification.

Section	Pass/Refer	Assessor Full Name	Assessor Signature
Understand the structure and function of the circulatory system			
Understand the structure and function of the respiratory system and skeleton (and joints)			
Understand the muscular system			
Understand the life-course of the musculoskeletal system and its implications (special populations)	PASS	D. FOSTER	
Understand energy systems and their relation to exercise			
Understand the nervous system and its relation to exercise			

Please complete 3 boxes below

Learner Name		IQA Name	
Learner Signature		IQA Signature	
Date		Date	

Understanding the structure and function of the circulatory system

Q1

Tick which statement is true from the two following statements.

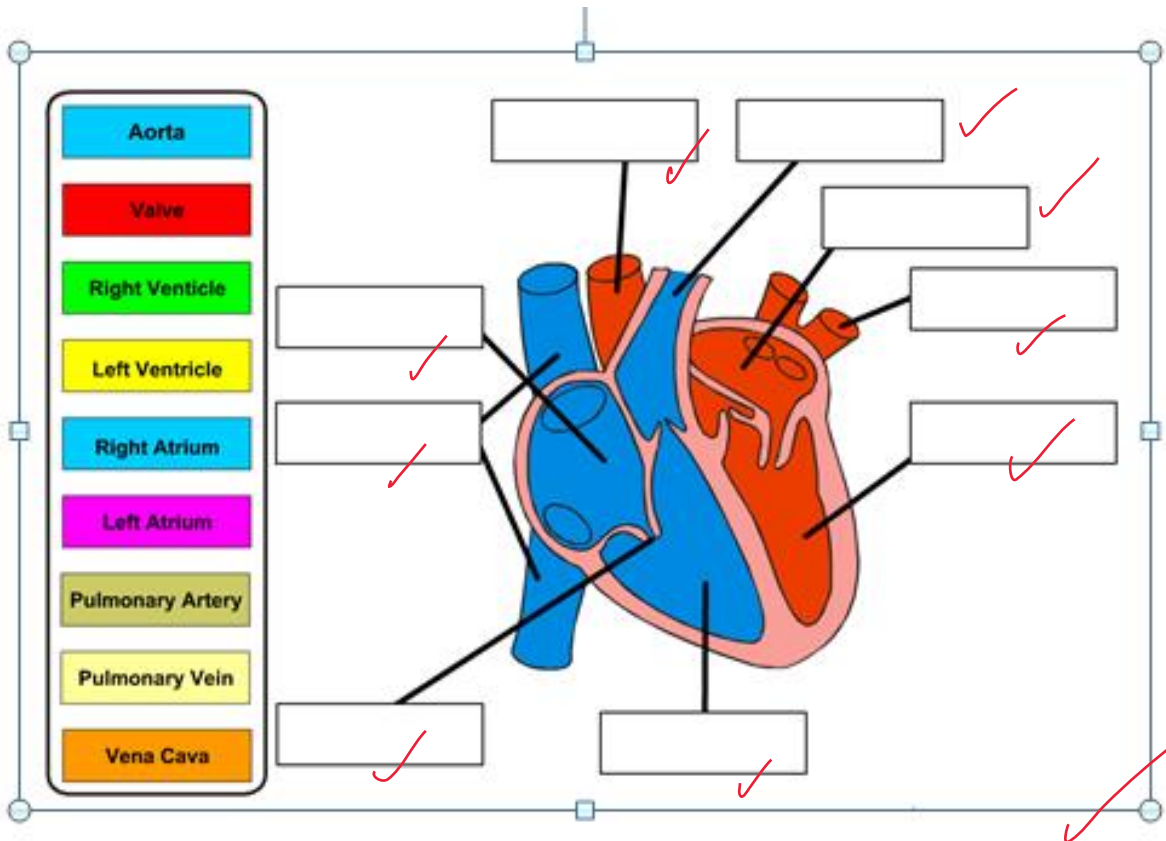
	Tick one
The heart is located on the left-hand side of the chest cavity	<input type="checkbox"/>
The heart is located on the right-hand side of the chest cavity	<input type="checkbox"/>

Q2

Describe the main function of the heart.

Q3

Complete the diagram by identifying the different chambers and major blood vessels of the heart












Q4

Using all the answers given in the previous question complete the flow table of blood through the heart. You must provide a description of the functions of each of the structures.

Learner Guidance:

- You must describe where it receives blood from and transports it to
- Identify whether it carries oxygenated or deoxygenated blood

Structure	Function
Pulmonary Vein	Major vein that carries oxygenated blood from the lungs to the heart
 Not directly from lungs	
Left Atrium	
 Left Ventricle	
 Aorta	
 Working Muscles	Oxygenated blood is delivered to the working muscles
 Not just the upper limbs	
Vena Cava	
 To which part of the heart?	
 Right Atrium	
 Right Ventricle	
 Pulmonary Artery	

Q5

Describe the role of the valves in the heart.

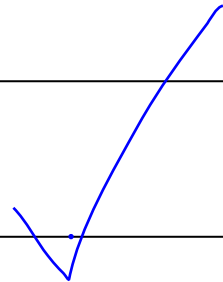


Q6

Describe systemic circulation.



More information required. See P49 of L2 manual

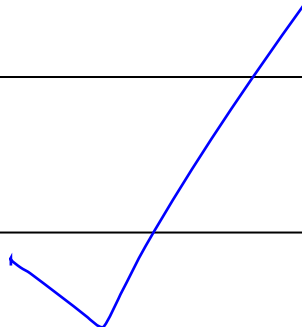


Q7

Describe pulmonary circulation.



More information required. See P49 of L2 manual



Q8

Describe two differences between the structure of arteries and veins



Q9

Describe two differences between the function of arteries and veins



Think about which carries blood under high/low pressure...

Q10

Describe the role of capillaries.



Q11

Describe one feature of a capillary that enable them to perform their role.



Q12

Define the following terms.

Blood Pressure	
Systolic Pressure	
Diastolic Pressure	
Hypotension	
Hypertension	



Q13

According to the NHS what range of blood pressure would be classified as normal?



Q14

According to the NHS, at what reading or higher would classify as high blood pressure?



**Pass/Refer**

Really good try, please work on your corrections

**Understand the structure and function of the respiratory system**

Q1 Describe where in the body the lungs are located.



Q2

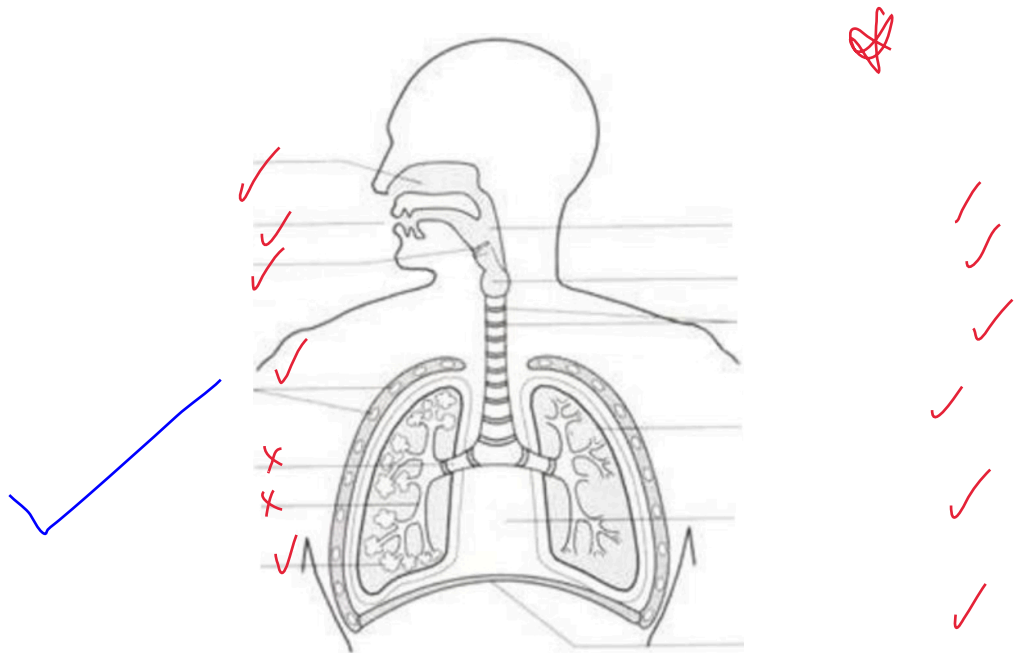
Describe the function of the lungs.



Q3

Complete the diagram below by filling in the boxes and identifying the different structures of the respiratory system.

- Diaphragm
- Lung
- Pharynx
- Bronchiole
- Bronchus
- Ribs
- Mouth
- Alveolus
- Nasal Cavity
- Rings of Cartilage
- Space occupied by the heart
- Larynx
- Epiglottis



Q4

Using some of the answers given in the previous question complete the flow table of air through the respiratory system. You must provide a description of the functions of each of the structures.

Structure	Function
Nasal Cavity	
Pharynx	
Larynx	
Epiglottis	



Bronchus		✓
Bronchiole		✓
Alveolus		✓
Diaphragm		✓

Q5

Identify two major muscles involved in respiration.

Two blue rectangular boxes are stacked vertically. Each box contains a white horizontal line, serving as a placeholder for text. A red checkmark is visible to the right of the bottom box.

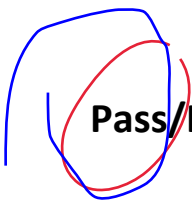
Q6

Where in the lungs does gaseous exchange take place?



Q7

Describe the movement of oxygen and carbon dioxide in the lungs during gaseous exchange.



**Pass/Refer**

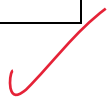
Good work, section complete on 1st attempt

**Understand the structure and function of the skeleton**

Q1

Describe the five functions of the skeleton.

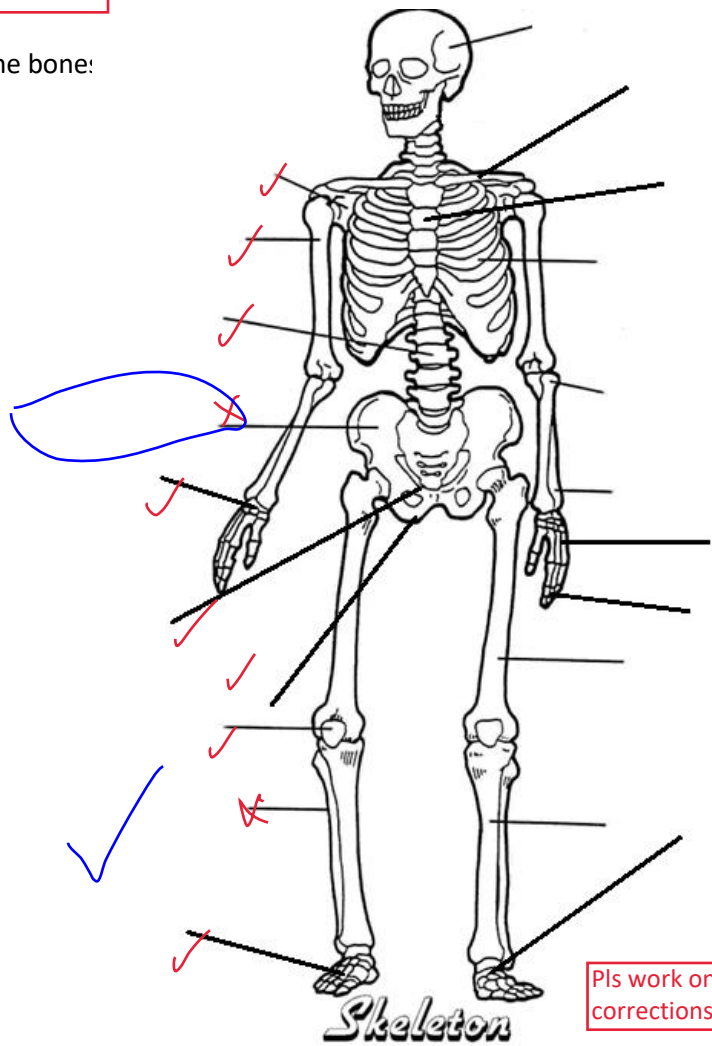
Function	Description



You have already used scapula - Please find the last bone of the pelvis from the list below

Q2 Correctly label the skeleton, use all the bone:

- Cranium
- Clavicle
- Ribs
- Sternum
- Humerus
- Radius
- Ulna
- Scapula
- Ilium
- Pubis
- Ischium
- Carpals
- Metacarpals
- Phalanges
- Femur
- Patella
- Tibia
- Fibula
- Tarsals
- Metatarsals
- Vertebral Column



Pls work on your corrections

Q3

Identify three bones that are part of the axial skeleton

Q4

Identify four bones that are part of the appendicular skeleton

Q5

There are five different classifications of bone, complete the table below by providing an example and explaining its function.

- Learner Guidance: Explain requires more analysis to demonstrate your understanding of the topic, short paragraph.

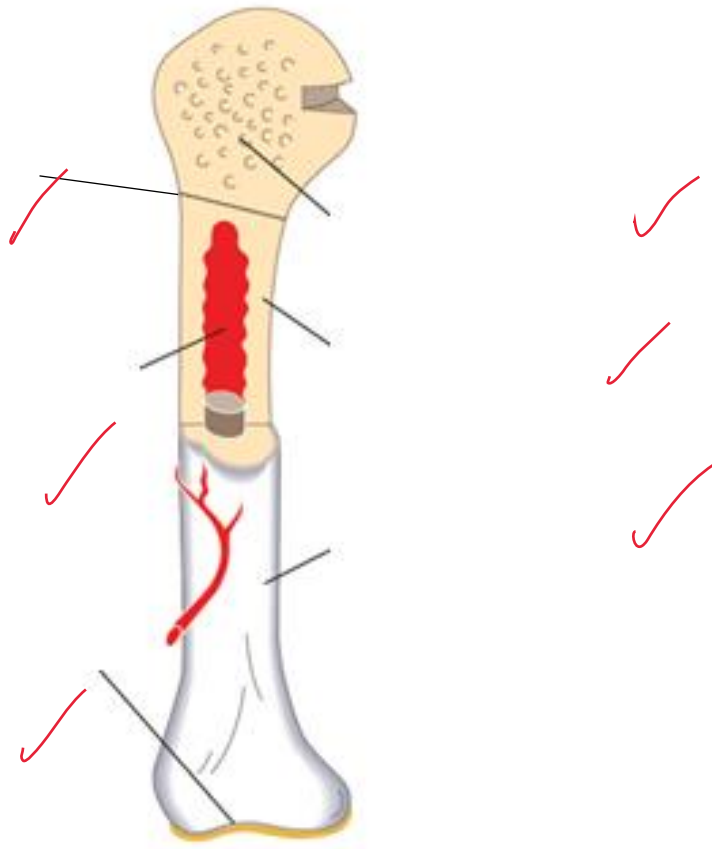
Type of bone	Example	Function



Q6

Identify the structure of a long bone by labelling the diagram.

Learner guidance: use structures of the long bone found on question 7 on the next page



Q7

For each of the structures of the long bone you have labelled in the previous question, complete the table below to explain their structure in more detail.

Structure	Explanation
Medullary Cavity	
Articular Cartilage	
Spongy Bone	
Compact Bone	
Periosteum	
Growth Plate	

✓  
✓  
✓  
\*  
✓  
✓

More detail required for compact bone

Q8

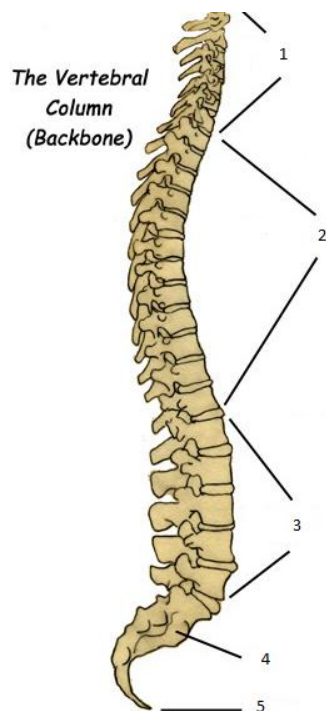
Explain the five stages of ossification (bone growth).

1	
2	
3	
4	
5	

Q9

Label the different sections of the spine using all the sections in the box below.

- Lumbar
- Thoracic
- Sacrum
- Cervical
- Coccyx



Q10

From the different sections labelled in the previous question, describe the potential ranges of motion of each section.

Section	Potential Ranges of Motion

✓  
✓  
✓  
~~✗~~  
~~✗~~

See p28 of L2 manual. MS 1.2.21

Range of movement incorrect for Sacrum and Coccyx... Check P28 of L2 manual

Q11

Describe what is meant by the term 'neutral spine'.

Not quite... think about all of the curves in the spine.

Q12

Which area of the spine would you expect to see the following natural curves?

Kyphotic

✓



Lordotic



Q13

Describe how a Lordotic spine affects the normal shape of the spine.



Q14

Which region of the spine?

Describe how a Kyphotic spine affects the normal shape of the spine.



Q15

Which region of the spine?

Describe how Scoliosis of the spine affects the normal shape of the spine.

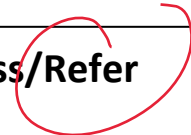


Q16

Describe how pregnancy can affect the normal shape of the spine.



**Pass/Refer**



Good effort, please work on your corrections

Understand joints in the skeleton

Q1

Complete the table below of the different classification of joints, include the potential movement available at each.

Classification of joint	Location of joint	Potential movement of joint



Q2

Describe the structure of the synovial membrane.



Q3

Describe the structure of the articular cartilage.



Q4

Describe the six different types of synovial joints and state the range of motion available at each.

[Empty box for joint description]

✓

[Empty box for joint description]

✓

[Empty box for joint description]

✓ ✗

[Empty box for joint description]

✓

[Empty box for joint description]

✓ ✗

[Empty box for joint description]

✓

Need to provide a better description of the joint... see P24 of the L2 manual

Q5

What joint actions are possible at the following joints?

Elbow

What can we do at the elbow? Look at your answer above for hinge joints

[Hand-drawn diagrams of an elbow joint showing flexion and extension]

✗

Elbow doesn't allow rotation... check the section on joints in your L2 manual

Spine Learner guidance: name at least 3 joint actions



Hip Learner guidance: name at least 4 joint actions



Q6

Describe each of the following joint actions and provide an example of a joint where it can occur.

Extension



Abduction



Plantar Flexion



**Pass/Refer**



Good attempt, please work on your corrections

**Understand the muscular system**

Q1

Complete the table below.

Different types of muscle tissue	Main characteristics	Main role



Q2

Complete the table below by describing the main structural points of a skeletal muscle.

Structure	Description
Muscle Fibre	
Fascicle	
Fascia	
Sarcomere	
Myofibril	

✓

✓

✓

✓

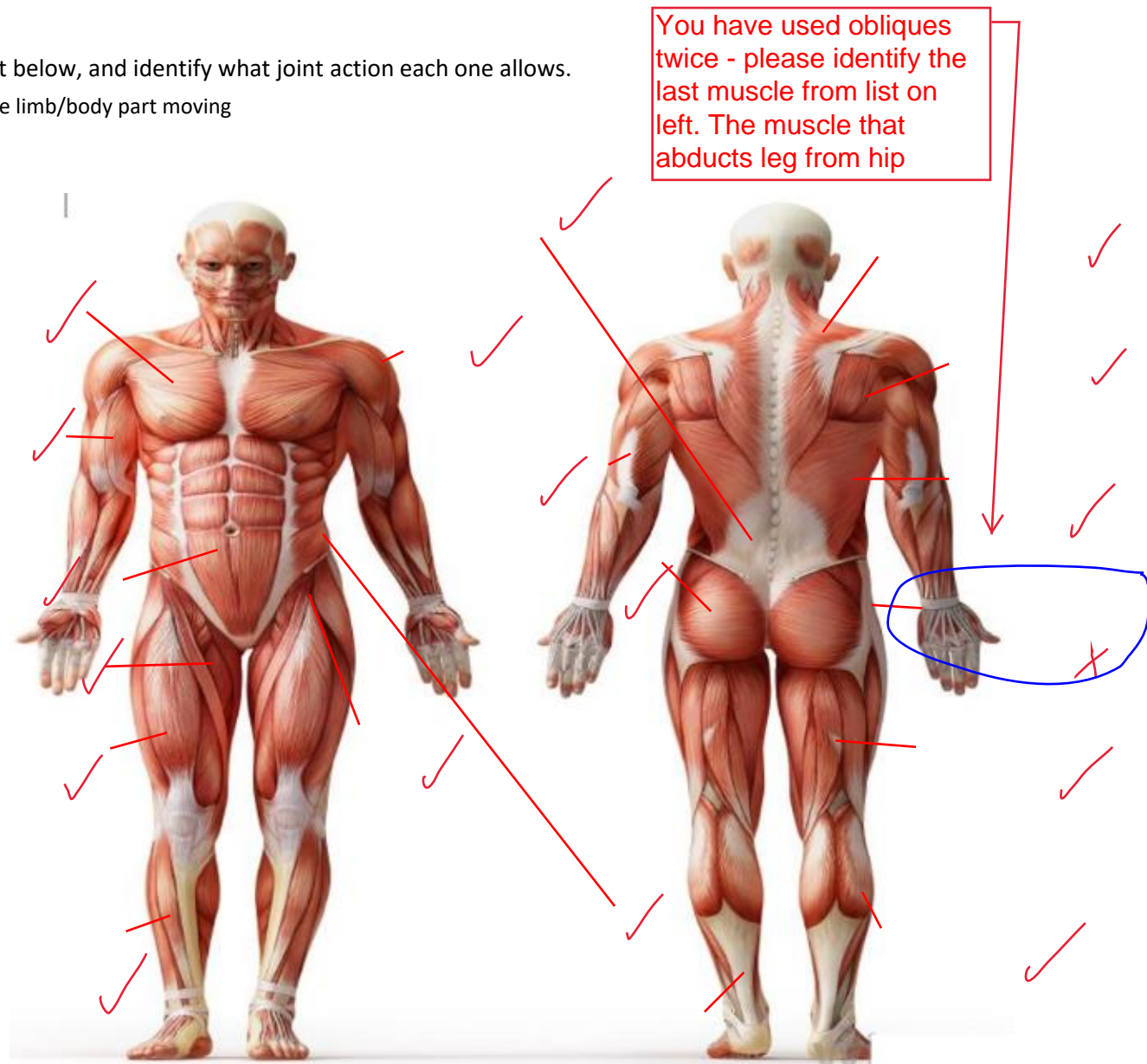
✓

Q3 Label the skeletal muscles using the muscles from the list below, and identify what joint action each one allows.

Learner guidance: when describing joint actions please identify the limb/body part moving

Muscle to locate	Action it allows
Rectus Abdominis	Flexion of the spine
Pectoralis Major	
Deltoids	
Tibialis Anterior	
Biceps Brachii	
Obliques	
Soleus	
Gastrocnemius	
Teres Major	
Gluteus Maximus	
Triceps Brachii	
Trapezius	
Erector Spinae	
Latissimus Dorsi	
Hamstrings	
Quadriceps	
Abductors	
Adductors	
Hip Flexors	

Pay attention to the body part... use P33 of your L2 manual



Erector Spinae used twice

Q4

Describe the structure of the pelvic floor muscles.



Q5

Describe two functions of the pelvic floor muscles.



Q6

Describe an concentric muscle contraction.



Q7

Describe an eccentric muscle contraction.







Q8

Describe an isometric muscle contraction.



Q9

Identify the joint action occurring in a barbell bicep curl during the concentric phase.





What is the joint action?  
(flexion, extension,  
adduction, etc)

Q10

Identify the joint action occurring in a barbell bicep curl during the eccentric phase.





What is the joint action?  
(flexion, extension,  
adduction, etc)

Q11

Complete the table below by identifying three different muscle fibre types and their main characteristics.

Muscle fibre types	Characteristics

Pass/Refer

Really good effort, please work on your corrections

**Understand the life-course of the musculoskeletal system and its implications for special populations exercise**

Q1

Describe two physical changes, and their implications for exercise, when training young people (in the 14-16 age range)

Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.


Q2

Describe two physical changes, and their implications for exercise, when training older people (50 plus age range)

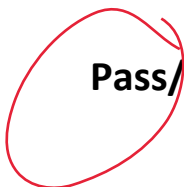
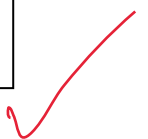
Learner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.



Q3

Describe two physical changes, and their implications for exercise, when training antenatal and postnatal women.

Learner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.



**Pass/Refer**

Good job... section  
complete on first  
attempt

**Understand energy systems and their relation to exercise**

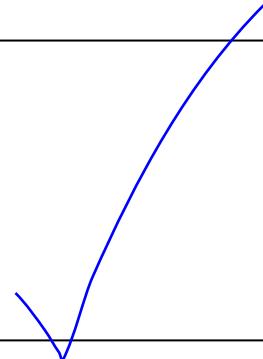
Q1

What does ATP stand for?



Q2

Describe what the role of carbohydrates, fats and protein are in the production of energy.



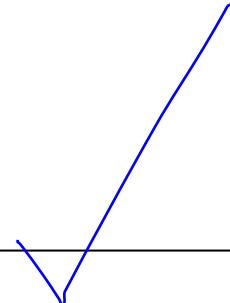
More information  
required on each... See  
P38 of your L2 manual

Q3

Explain the use of the creatine phosphate (CP) or phosphocreatine system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system will fuel.



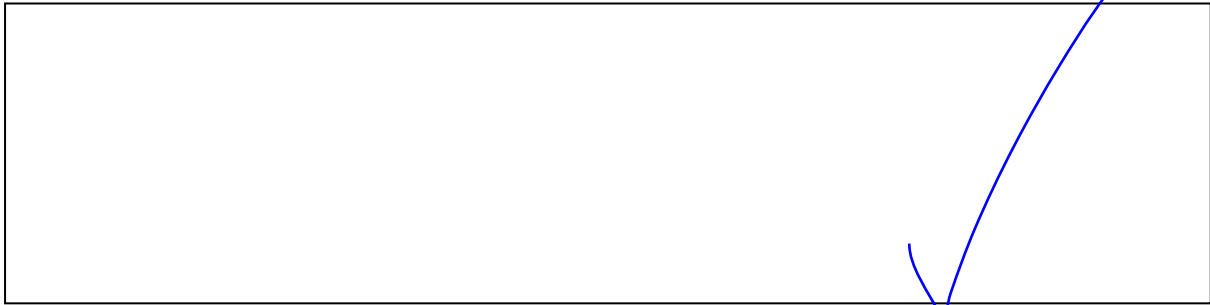
More information  
required, see P40 of your  
L2 manual... Also give  
example of exercise/  
activity

Q4

Explain the use of the lactic acid system/anaerobic system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system will fuel.



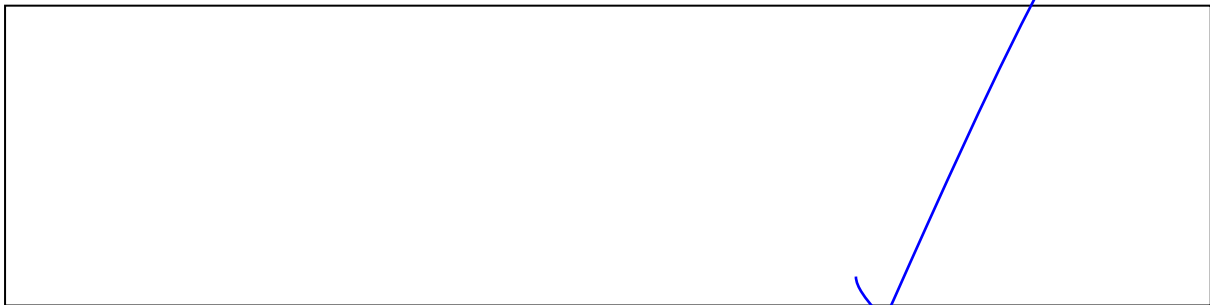
Give example activity/  
exercise

Q5

Explain the use of the aerobic system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system



Give example activity/  
exercise

**Pass/Refer**

Please work on your  
corrections

Understand the nervous system and its relation to exercise

Q1

Describe three roles and functions of the nervous system.



Q2

Describe the principles of muscle contraction.

Learner Guidance – What are the role of nerves in muscle contraction? Think about nerve impulses



More information required... See section on the nervous system in your L2 manual

Q3

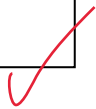
Describe the 'all or none' law.

Learner Guidance – Think about motor unit recruitment



Q4

Describe what determines whether or not a contraction takes place within a motor unit.



Q5

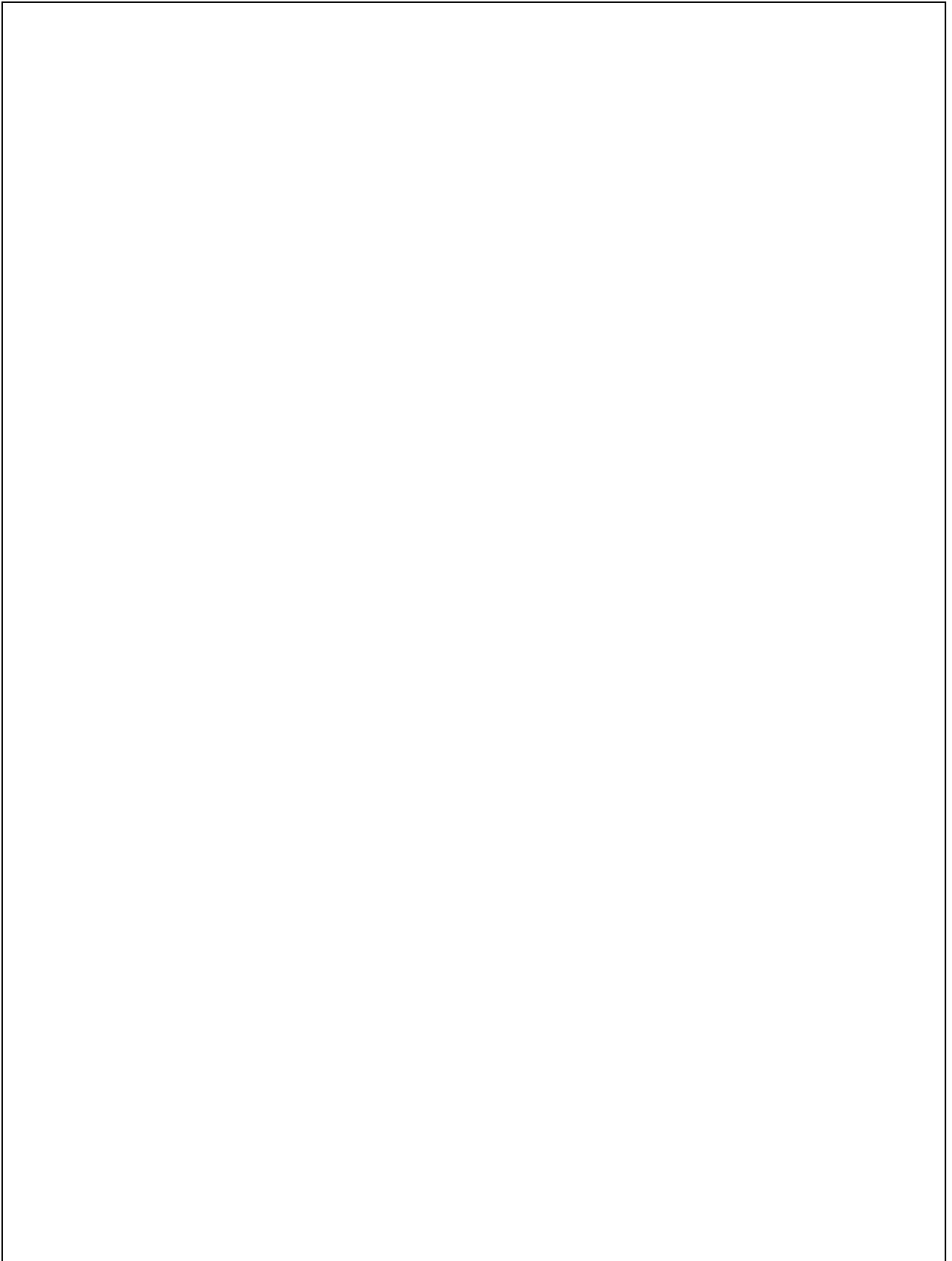
Describe two adaptations that occur in the neuromuscular system with regular exercise that improves motor fitness.



**Pass/Refer**

Only one question in this section requiring your attention.

## Assessor Feedback

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## Assessor Feedback

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