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)			
Understand energy systems and their relation to exercise			
Understand the nervous system and its relation to exercise			_

Learner Name	IQA Name	
Learner Signature	IQA Signature	
Date	Date	

EDUCATE FITNESS.

Understanding the structure and function of the circulatory system

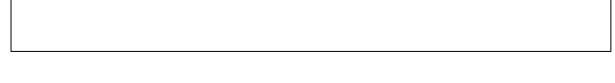
Q1

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	
The heart is located on the right-hand side of the chest cavity	

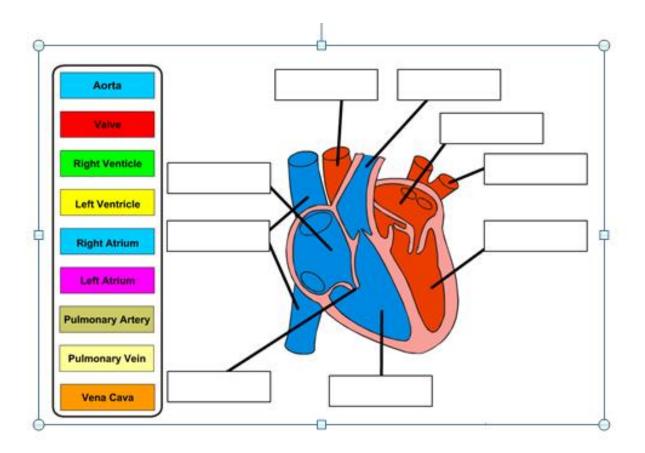
Q2

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
Left Atrium	
Left Ventricle	
Aorta	
Working Muscles	Oxygenated blood is delivered to the working muscles
Vena Cava	
Right Atrium	
Right Ventricle	
Pulmonary Artery	

Q5
Describe the role of the valves in the heart.
Q6
Describe systemic circulation.
Q7
Describe pulmonary circulation.
Q8
Describe two differences between the <u>structure</u> of arteries and veins

ı

Q9
Describe two differences between the <u>function</u> of arteries and veins
010
Q10
Describe the role of capillaries.
Q11
Describe one feature of a capillary that enable them to perform their role.

Q12

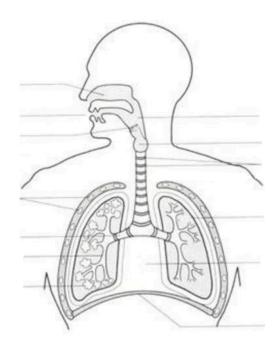
Define the following terms.

Blood Pressure	
Systolic Pressure	
·	
Diastolic Pressure	
Hypotension	
Hypertension	
Q13	
	at range of blood pressure would be classified as normal?
According to the Who whi	at range of blood pressure would be diassined as normal.

Q14
According to the NHS, at what reading or higher would classify as high blood pressure?
Pass/Refer
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.

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

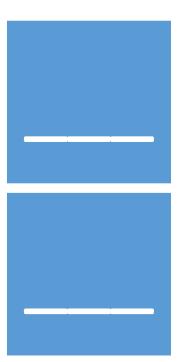
Using some of the answers given in the previous question complete the flow table of air through the respiratory system. You must provide a description of the functions of each of the structures.

Structure	Function
Nasal Cavity	
,	
Pharynx	
Lanuny	
Larynx	
Epiglottis	
1 0	

Bronchus	
Bronchiole	
Alveolus	
Diaphragm	

Q5

Identify two major muscles involved in respiration.



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	
<u>U</u>	nderstand the structure and function of the skeleton
Q1	
Describe the five functio	ns of the skeleton.
Function	Description

Q2 Correctly label the skeleton, use	e all the bone:
Cranium	
Clavicle	
Ribs	
Sternum	
Humerus	
Radius	からろん
Ulna	
Scapula	
Ilium	
Pubis	
Ischium	
Carpals	V 11#
Metacarpals	· /
Phalanges	/// /
Femur	
Patella	
Tibia	
Fibula	
Tarsals	
Metatarsals	
Vertebral Column	
Q3 Identify three bones that are part o	f the axial skeleton
Q4	
Identify four bones that are part of	the appendicular skeleton

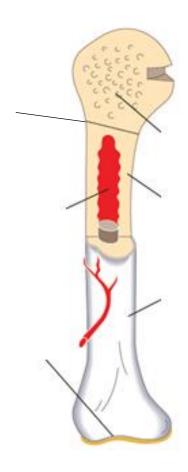
There are five different classifications of bone, complete the table below by providing an example and <u>explaining</u> its function.

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

Type of bone	Example	Function

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	

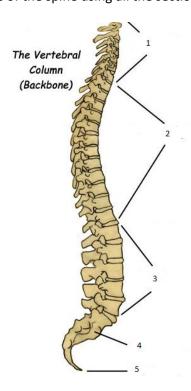
Explain the five stages of ossification (bone growth).

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
Q11	
Describe what is meant b	by the term 'neutral 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
Describe how a Kyphotic spine affects the normal shape of the spine.
Q15
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.

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.	
Q5	
What joint actions are possible at the following joints?	

Elbow

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		

Understand the muscular system

Q1
Complete the table below.

Different types of	Main characteristics	Main role
muscle tissue		

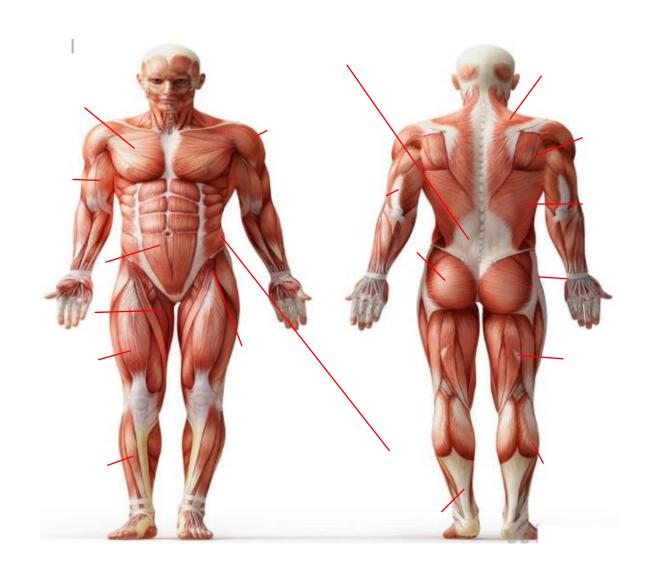
Q2

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	



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.
Q10
Identify the joint action occurring in a barbell bicep curl during the eccentric phase.

Q11

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

Muscle fibre types	Characteristics

Pass/Refer

<u>Understand the life-course of the musculoskeletal system and its implications for special populations exercise</u>

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.

(22
	Describe two physical changes, and their implications for exercise, when training older people (50 plus age range)
	Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles joint and bone mineral density changes.
L	
(23
	Describe two physical changes, and their implications for exercise, when training antenatal and postnatal women.
	Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles joint and bone mineral density changes.
- 1	

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.
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.

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.

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

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
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.

Assessor	Assessor Feedback					

Assessoi	r Feedback			