

Unit 5 Assignment A Musculoskeletal and Cardiorespiratory Adaptations

Checklist and Knowledge Organiser

Success Criteria	Evidence Required	Included?
2A.P1	Describe how the musculoskeletal system responds to short term exercise -Create a poster -Include 4 different adaptations -Explain what changes happens -Include images	
2A.M1	Explain the responses of the musculoskeletal system to short term exercise -Add to your poster -Why do these 4 changes take place -Explain how and why these could help sport performance -Provide a sporting example	
2A.P3	Describe how the musculoskeletal system responds to long term exercise -Create a poster -Include 4 different adaptations -Explain what changes happens -Include images	
2A.M3	Explain the responses of the musculoskeletal system to long term exercise -Add to your poster -Why do these 4 changes take place -Explain how and why these could help sport performance -Provide a sporting example	
2A.P2	Describe how the cardiorespiratory system responds to short term exercise -Create a poster -Include 4 different adaptations -Explain what changes happen -Include images	
2A.M2	Explain the responses of the cardiorespiratory system to short term exercise -Add to your poster -Why do these 4 changes take place -Explain how and why these could help sport performance -Provide a sporting example	
2A.P4	Describe how the cardiorespiratory system responds to long term exercise -Create a poster -Include 4 different adaptations -Explain what changes happen -Include images	
2A.M4	Explain the responses of the cardiorespiratory system to long term exercise -Add to your poster -Why do these 4 changes take place -Explain how and why these could help sport performance -Provide a sporting example	
2A.D1	Compare and contrast how the musculoskeletal and cardiorespiratory systems respond and adapt to exercise -Pick 3 different sports -Describe the similarities (compare) of how the 3 sports adapt to improve their performance -Use 1 musculoskeletal adaptation and 1 cardiorespiratory adaptation -Describe the differences (contrast) of how the 3 sports adapt to improve their performance -Use 1 musculoskeletal adaptations and 1 cardiorespiratory adaptation	

Musculoskeletal System:

Made up of the muscles, connective tissue and the skeleton.

Short Term Adaptations:

Increased blood supply – exercise causes our heart rate to increase so that we can pump more blood around the body to supply the working muscles with oxygen

Increased muscle pliability – as we exercise our muscles get warmer which causes them to become more pliable (flexible) which will allow you to stretch further and reduce risk of an injury

Micro-tears in muscle fibres – our muscles are made up of thousands of fibres and small tears occur when you do resistance training. This triggers the muscles to repair making them bigger and stronger to help lift heavier weights

New bone formation – weight training places stress onto the bones this triggers osteoblasts to build new bone to make them stronger and reduce the risk of breaking

Increased production of synovial fluid – exercise increases the production of and make the synovial fluid warmer and thinner which will help our joints move more freely and reduce the risk of injury

Increased nourishment of cartilage – during exercise cartilage increases the absorption of nutrients from the synovial fluid to help strengthen and nourish the cartilage to prevent it from becoming damaged

Increased range of movement – exercise causes our ligaments to become more elastic and enable our joints to then move further with less chance of an injury

Long Term Adaptations:

Increase in mitochondria – endurance training increases the size and number which allows more oxygen to be readily available to our muscles

Muscle hypertrophy – training increases the size and number of our fast and slow twitch muscle fibres causing our muscles to become bigger, stronger and contract faster

Improved posture – our core muscles maintain our posture and weight training will strengthen these to reduce our risk of injury and from wasting energy

Increased bone density – training will increase osteoblast production and calcium retention which will improve bone density and reduce the risk of bones breaking

Decreased risk of osteoporosis – a condition that weakens the bones, by improving calcium content and density of the bones through training will risk the onset and impacts of this disease

Increased joint stability – training will aid in the ligaments and tendons to become stronger and more elastic and strengthen the cartilage, this will help protect and allow joints to produce greater movement with less negative impacts on the structure

Cardiorespiratory System:

Made up of the lungs, heart and blood vessels

Short term adaptations:

Increased heart rate and blood flow – an increase in adrenaline due to an anticipatory rise before we start to exercise causes our heart rate to increase. This causes our blood flow to increase to get more oxygen to the muscles

Increased breathing rate – exercise causes our breathing rate to increase to take in more oxygen to our muscles and carbon dioxide away

Sweat production and skin reddening – exercise causes the body temperature to increase and raise blood to the surface of the skin which causes us to go red and sweat to help control our body temperature

Redistribution of blood – when we exercise our blood is redistributed to our muscles and away from non-vital organs like our digestive system

Increased cardiac output – exercise causes the amount of blood pumped out of the heart per minute to increase to get more oxygen to the working muscles

Long term adaptations:

Efficient gaseous exchange – endurance training cause an increase in recruitment of alveoli and capillary density to allow more oxygen to be up taken and carbon dioxide to be removed

Decrease in resting heart rate – exercise decreases how often the heart beats per minute when at rest, as the heart has become stronger and so pumps more blood out with each beat

Cardiac Hypertrophy – exercise causes the heart muscle to become stronger and bigger causing more blood to be pumped with each beat and more forcefully

Decreased risk of hypertension – a high blood pressure condition, regular exercise reduces the stress being placed on the blood vessel walls resulting in a decrease of blood pressure

Higher VO₂ max – this is the maximum amount of oxygen up taken. Regular exercise will cause this to increase due to an increased efficiency of the system getting oxygen around the body

Increased vital capacity – this is the amount of air that can be forcibly expelled from the lungs after breathing as deep as possible. Regular exercise increases the size and efficiency of the lungs to enable more oxygen in and carbon dioxide out