**Coursework RO43: The body’s response to physical activity**

**Scenario:** You are interested in physical education and sport science as a possible career in the future. To get a greater understanding of what is involved you have volunteered to do some work supporting the schools’ sport department.

### Task 1: The key components of the musculo-skeletal and cardio-respiratory systems, their functions and roles

**Learning Outcome 1 is assessed in this task.**

You are asked by the Head of the Schools’ Sport department to update some display areas in the sports hall. The display is intended to encourage students to think about what their bodies are doing while they take part in sport and physical activity.

Your task is to identify key components of the musculo-skeletal and cardio-respiratory systems and their functions. You will also need to describe the role of the musculo-skeletal system in producing movement and the role of the cardio-respiratory system during physical activity.

Use pages 80-98 of the text-book, your notes from class and your own independent research to help you. Ensure you have used all key words in your answer!

Heading 1:  **The Skeleton**

**Label and define the major bones**

Success criteria:

* Define Musculo-skeletal system
* List the major bones
* Insert an unlabelled diagram of the skeleton and label the major bones (insert an image from google then press ‘insert – textbox’ to label the bones)

Heading **2: Functions of the skeleton**

**Explain the 4 functions performed by the skeleton**

*One function of the skeleton is …*

*More specifically ….*

*++ A sporting example of this would be during exercise, your skeleton supports your heart, lungs and blood vessels*

*Another function is…*

**Heading 3: Skeletal muscles  
Recall and explain the major muscles**

Success criteria:

* Insert an unlabelled diagram from google images and label: biceps, triceps, abdominals, pectorals, hamstrings, soleus, gluteals, quadriceps, latissimus dorsi, deltoids, trapezius, gastrocnemius
* Write a sentence explaining where each muscle is found
* Give a practical sporting example when each muscle is used e.g. during a bicep curl, the biceps and triceps are the major muscles that are in use.

**Heading 4: 6 synovial joints**

**Explain the function of the 6 types of synovial joint**

Success criteria:

* Define the 6 types of joints
* Describe where on the body each joint type is found.
* Provide 3 sporting examples of where this type of joint is used

Heading 5**: Functions of connective tissue**

**Explain the function of each type of connective tissue (ligament, tendon, cartilage).**

**Success criteria:**

* Define ligament, cartilage and tendon
* Describe the function of each and what they are made of
* Describe where you might find them in the body

Heading 6: **Blood Vessels**

**Explain, in detail, the structure and function of the 3 types of blood vessels**

* Recall the 3 major blood vessels
* Recall (you can include a diagram) the structure of each type of blood vessel
* Describe the function of each type of blood vessel and give an example of each (+ where each one is found)
* Explain the structure of each type of blood vessel e.g. arteries have thick muscular walls and narrow lumens to maintain high blood pressure

**Heading 7:: Components of blood**

**Explain, in detail, the 4 main components of blood**

* Recall the 4 main components of blood
* Describe the function of each major component of blood
* Challenge: Explain how red blood cells are adapted for their function

*Key words:* ***oxygen, haemoglobin, no nucleus***

**Heading 8: The respiratory system**

**Explain, in detail, the respiratory system**

* Recall the 8 structures of the respiratory system (include a diagram)
* State the step by step process of getting air to the lungs
* Explain what happens to the diaphragm during
* Inhalation: the diaphragm … this is so…
* Exhalation: the diaphragm … this is so…

**Heading 9: Functions of the cardio-respiratory system**

**Explain, in detail, the functions of the cardio-respiratory system**

* Recall the 4 major things that make up the cardio-respiratory system
* Describe the importance of the transport of oxygen in the cardio-respiratory system. Include in your answer: gas exchange, lungs, alveoli, capillaries, +diffusion
* Describe the importance of the transport of nutrients, hormones and waste products via the blood in the cardio-respiratory system. Include in your answer: glucose, carbon dioxide, hormones +active transport
* Describe the importance of the regulation of body temperature in the cardio-respiratory system. Include in your answer: 37 degrees, shivering, sweating +thermoregulation, homeostasis
* Describe the importance of the regulation of bodily fluid levels in the cardio-respiratory system. Include in your answer: constant, dehydration, hyperhydration, +electrolytes

**Heading 10: The 6 movement types**

**Explain the function of the 6 movement types**

Success criteria:

* Recall the 6 types of movement
* Describe each of the 6 movement types, including a sporting example for each one
* \* State the major muscles used in the sporting examples above

**Heading 11: Muscular contractions**

**Explain the different types of muscular contractions**

Success criteria:

* Recall the two types of muscle contractions
* Describe and name an example for isometric contractions
* Describe isotonic contractions
* Recall the two types of isotonic contractions and provide an example for each one

**Heading 12: Heart rate and blood pressure during exercise**

**Explain the role of the cardio-respiratory system during physical activity (page 94-95)**

**Heart Rate:**

* *The cardio-respiratory system includes…*
* *Heart rate is… the units for heart rate are…*
* *During exercise, heart rate … this is because..*
* *The two most common arteries used to measure heart rate are… these are found…*
* *The average resting heart rate is…*
* *\*Explain how resting heart rate might differ between a professional footballer and a sedentary person*

**Blood Pressure:**

* ***Cardiac output*** *is…*
* *Stroke volume is…*
* *The effect on exercise on cardiac output is…*
* *There are 2 measurements of blood pressure, they are…*
* *More specifically*
* *The units for blood pressure is…*
* *The average blood pressure measurement of a young fit person is…*
* *Research: Explain the consequence of having a high blood pressure*

**Heading 13: The vascular shunt mechanism (page 95-96)**

**Success criteria:**

* Define the vascular shunt mechanism
* Recall how vascular shunt mechanism is achieved (vasocontraction and vasodilation)
* Describe vasoconstriction
* Describe vasodilation
* Explain a **sporting example** of the vascular shunt mechanism.   
  Include in your answer a) name of major muscle in use  
  b) name of ‘inactive’ organ