Year 9 Biology Investigation

**Does exercise affects the way your heart beats?**

The human body relies on many systems to keep its cells supplied with the best environment for them to operate in. This is necessary as humans are multi-cellular organisms. Specialised cells are organised in groups to carry out specialised tasks, which either supply or remove materials from all of the cells of the body. This enables all of the functions of life (GRIMNER/MRSGREN) to be carried out, even by cells deep in the body.

**Does exercise affects the way your heart beats?**

Design an experiment, which will enable you to discuss the above question.

Things to consider

* Independent variable
* Dependant variable
* Controlled variables
* The technique for recording heart rate
* The duration of exercise periods, rest periods and when heart rate is taken
* How can you increase the reliability of your investigation?
* How should your results be recorded?
* How should the data be presented?
* How will trends be able to be shown?
* What is the standard format for presenting information from an experiment?
* Three-part conclusion. Summary of results, discussion explanation related to hypothesis and review of experiment improvements.

**TASK 1 Carry out and write up your investigation**

Things to consider: Discussion of findings in the conclusion.

The above experiment is really a reflection of cell activity.

What are the tissues that are involved in the activity?

What is the chemical reaction, which seems to be at the centre of this activity?

How can this be best expressed?

**Task 2 Prepare a chart to summarise the findings of your investigation**

Multi-celled organisms over come problems being multi-cellular by having specialised cells and a hierarchical system of organisation. For the investigation above explain how different systems work together to enable the cells to perform this function (exercise). Outline briefly the connection each system has to the chemical reaction occurring in cells.

Flow charts are a great way of showing interactions, which lead to specific results. Use flow charts to describe the changes that occur in the cells and the body during exercise. Incorporate the effect that each system has on the environment that the cells exist in, to maintain constant functioning.

Experimental write-up outline

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section | Break down | Your score | Marks available |  |
| Hypothesis | Must have statement  With IV and DV |  | /1  /2 |  |
| Materials |  |  | /1 |  |
| Method | Good description  Step by step (dot point or …) |  | /1  /1 |  |
| Observation |  |  | /1 |  |
| Results | Table  Labels and units  Averages |  | /1  /1  /1 |  |
| Conclusion | 1) summary of Obs/results  Graph  Statement of trends |  | /1  /5  /1 |  |
|  | 2) Comment on hypothesis  Explanation WHY? |  | /1  /5 |  |
|  | 3) Improvements to experiment |  | /3 |  |
| Presentation | Do you care about your work? |  | /1 |  |
|  |  |  |  |  |
| Total |  |  | /27 |  |
|  |  |  |  |  |
| As a percentage |  |  | /100 |  |
|  |  |  |  |  |

**Vocabulary**

Cellular respiration

Heart rate

Pulse

Oxygen

Carbon dioxide

Blood

Blood supply

Arteries

Capillaries

Muscle contraction

Energy

Veins

Circulation

Plasma

Red blood cells

Haemoglobin

nutrients

**Extension vocab**

Oxyhaemoglobin

Carboxyhaemoglobin

Stroke volume

ATP

Excretion

Lung

Alveoli

Breathing

Gas exchange