***Human Biology ATAR – Task 3: Science Inquiry***

***Cardiovascular Health in teenagers (5%)***

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| --- | --- | --- | --- |
| Name: | | | |
| Time allowed: 2 Lessons | | | |
| **Section** | Your Mark | Marks available | Percentage of Investigation |
| **Section 1:**  Introduction, Materials and Method and Results |  | 24 | 48% |
| **Section 2**:  Validation Test |  | 26 | 52% |
|  |  | **50** | **100%** |

**Declaration of Authenticity**

I (Student Name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ declare that this work is my own and I have not plagiarised from any source.

Signature:  
  
Date:

**Cardiovascular Health Investigation**

**Aim:** Design an experiment to test the effect of lifestyle factors on resting heart rate.

**This investigation will take 3 lessons:**

**Lesson 1** (Thursday Week 1): Planning and researching the investigation

**Lesson 2** (Friday Week 1): Conducting the investigation

Tasks to complete at home: Writing half-laboratory report - introduction, materials, data

**Lesson 3** (Friday Week 2):

* Submission of half-lab report (Results and Graph)
* Completion of Validation Test

**Background Information:**

One easy measure of Cardiovascular Health is resting heart rate. Resting heart rate is the number of times your heart beats per minute when you are at rest. Factors that affect resting heart rate are things such as regular exercise, age, stress and body size. You need to investigate **one** of these factors to determine if and how affects resting heart rate.

*E.g. If you were to investigate the effect of regular exercise on resting heart rate you might get people to complete a survey asking them how much exercise they do each day, then measure their resting heart rate.*

Your classmates are your best source of subjects.

**Outline:**

You may work in groups of 2-3 to collect the data but the write up of your introduction, method and results must be individual.

**Plan the investigation:**

Things to consider when planning your investigation:

* research and provide background information on heart rate and factors that affect it.
* devise a hypothesis and choose dependent and independent variables for your investigation
* identify variables to control
* decide upon the appropriate sample size, trials and data collection methods
* describe, in detail, the methodology you will use during your investigation
* decide upon the data recording method.

**Conduct the investigation**

* set up times and places for the measurements to be taken
* carry out data collection from test subjects

**Half-Laboratory Report: Due Friday Week 2**

**Introduction:**  **(10 marks)**

* include an introduction to the investigation
* include the background research on heart rate and factors that affect it
* write the hypothesis for the investigation
* identify the dependent and independent variables

**Materials and method:**  **(6 marks)**

* include a list of materials used in the investigation
* include details on the method used to collect the data
* make sure to ensure that your method increases reliability and validity of your experiment
* *Note: As you are writing the method in your half-lab report after you have completed the experiment then you must write it in paragraph form, in past tense, and ensure that you do not use ‘I’ or ‘We’.*

**Results:**  **(8 marks)**

* provide your results in an appropriate table
* show processing of raw data by identifying any outliers and working out averages
* plot appropriate graphs **by hand** to show results

**Validation Test: Friday Week 2**

**Things to consider from your data:**  
*(do not need to be submitted but think about this before coming into the validation test)*

* What trends/patterns are present in your data, why might they be occurring?
* Was your experiment reliable/valid? - How could this be improved?
* Were there any limitations in your experimental procedure?
* Are there any improvements that you would make?

***Section 1: Marking Key***

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| --- | --- | --- | --- | --- | --- | --- |
| **Introduction (10 Marks)** | | | | | | |
| **Introduction** | The lead in information requires more information or clarity. It introduces the aim but does not relate it to the topic. (1) | | | The lead in information is concise and develops a clear understanding of the report to follow. It introduces the topic and relates the aims of the experiment to this. (2) | | |
| **Research** | Some background research about heart rate, heart health and how the chosen factor affects heart rate is included but it is lacking detail or is incorrect. It does not provide insight into the phenomena that was investigated. (1) | | Background research includes mostly detailed and correct information about heart rate, heart health and how the chosen factor affects heart rate. It provides some insight into the phenomena that was investigated. (2) | | Background research includes detailed and correct information about heart rate, heart health and how the chosen factor affects heart rate. It provides clear insight into the phenomena that was investigated. (3) | |
| **Hypothesis** | Writes a simple hypothesis relating dependent and independent variables and stating the direction of effect. (1) | | | Writes a hypothesis relating dependent and independent variables and states the direction of effect and justification for this prediction. (2) | | |
| **Variables** | Only one variable, dependent, independent or controlled is correctly identified.  (1) | | Two variables, independent, dependent or controlled are correctly identified.  (2) | | Independent, dependent and all controlled variables are correctly identified.  (3) | |
| **Materials and Method (6 marks)** | | | | | | |
| **Materials** | Lists all materials with quantities used in the experiment is included (1) | | | | | |
| **Method** | The experimental method lacks clarity. It is not written logically. It contains grammatical errors and does not use correct terminology. (1) | | The procedure is written clearly. It is logical, uses mostly correct terminology and grammar. However, there are some steps in the method that are missing or some steps that require further detail. (2) | | The procedure is written in a logical order, all steps are included in full sentences, correct terminology and grammar are used. (3) | |
| **Reliability & Validity** | The method included **one** of the following:   * Controlled for all controllable variables, ensuring that the experiment and valid * Included the use of repeat trials to increase reliability. (1) | | | The method:   * Controlled for all controllable variables, ensuring that the experiment and valid * Included the use of repeat trials to increase reliability. (2) | | |
| **Results (8 marks)** | | | | | | |
| **Data Analysis** | The data only includes **one** of the following:   * Averages have been calculated for individuals * Data has been grouped into the chosen factor and the averages calculated (1) | | | The data includes **both** of the following:   * Averages have been calculated for individuals * Data has been grouped into the chosen factor and the averages calculated (2) | | |
| **Table Format** | The results table addresses only **one** of the following:   * It uses appropriate headings, including units * It is presented in an appropriate and easy to read format (1) | | | The results table addresses **both** of the following:   * It uses appropriate headings, including units * It is presented in an appropriate and easy to read format (2) | | |
| **Graphing** | Graph includes only **one** of the following:   * uses appropriate title, stating independent and dependent variables * correctly labels axes with names and units * uses correct type of graph * plotted graph correctly (1) | Graph includes only **two** of the following:   * uses appropriate title, stating independent and dependent variables * correctly labels axes with names and units * uses correct type of graph * plotted graph correctly (2) | | Graph includes only **three** of the following:   * uses appropriate title, stating independent and dependent variables * correctly labels axes with names and units * uses correct type of graph * plotted graph correctly (3) | | Graph includes **all** the following:   * uses appropriate title, stating independent and dependent variables * correctly labels axes with names and units * uses correct type of graph * plotted graph correctly (4) |