Human Biology – General Year 12 2019

## Task 1 – Unit 3

**Assessment Type:** Science Inquiry

**Conditions**

Period allowed for completion of the task:

* Time to plan and prepare for your practical.
* 120 minutes in class to complete practical and validation

**Task Weighting :** 7% **Due Date: Score : Part A : /43**

**Name :**

**Total : /43**

***BACKGROUND INFORMATION***

Your physical work capacity is a measure of your ability to do physical work. You determine it by measuring your cardiovascular fitness. You can think of your cardiovascular fitness as the sum of the heart muscle fitness, blood vessel efficiency and ventilator muscle fitness. You can improve cardiovascular fitness with a regular exercise program. The cardiovascular system circulates blood throughout the body, which supplies muscles with oxygen and other nutrients whilst removing waste products. Each time the heart beats; blood is either pumped out of the heart to the body or to the lungs with waste products. Heart rate refers to the number of times the heart beats per minute to supply oxygen to muscles and remove waste products by taking them to the lungs via the heart. The number of beats is directly related to the workload being placed on the heart and their cardiovascular fitness. For adults 18 and older, a normal resting heart rate is between 60 and 100 beats per minute (bpm), depending on the person’s physical condition and age. The Harvard step test is a type of cardiac stress test for detecting and diagnosing cardiovascular disease. It also is a good measurement of fitness and a person's ability to recover after a strenuous exercise. The more quickly the heart rate returns to resting, the better shape the person

**Aim: To investigate the effect of increasing time exercising on a subject’s heart rate.**

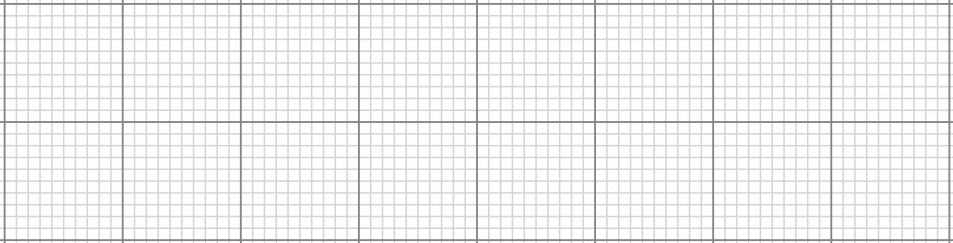
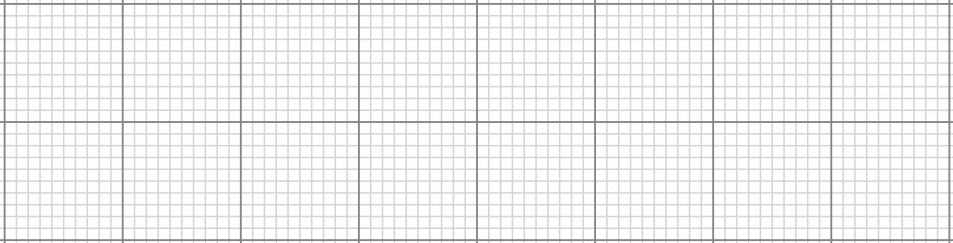
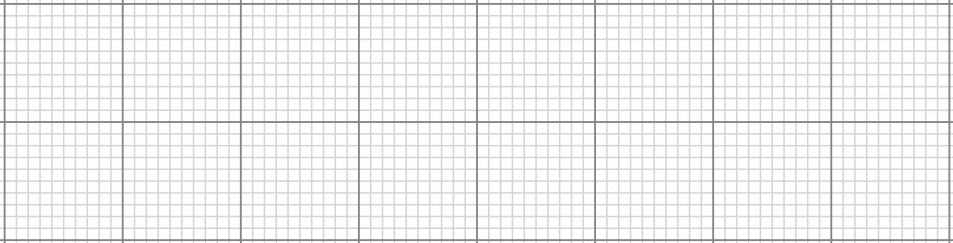
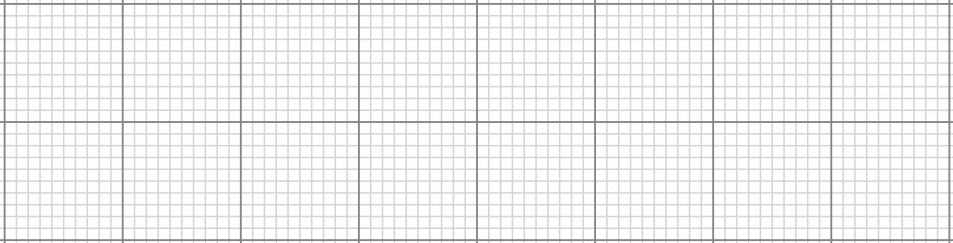
1. State a possible hypothesis for this experiment (2 Marks)

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1. Determine the following (2 Marks)
2. Independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. State two controlled variables and explain why they need to be controlled. (3 Marks)

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1. Create an appropriate table to represent all of your data. (2 Marks)
2. Graph the heart rate of your three test subjects on the grid below. (6 Marks)



1. For all your data obtained, calculate the: (4 Marks)
2. Mean
3. Median
4. Mode
5. Range
6. Describe the trends in your graph and explain what conclusions can be drawn from your results. Use your data to justify your conclusions. (4 Marks)

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1. Explain the purpose of taking the resting heart rate of each subject at the start of the experiment

(2 Marks)

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1. Explain two ways in which you could improve the reliability of the results obtained and justify how your improvements would increase the accuracy of the results obtained. (4 Marks)

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1. Of your sample, state who appears to have the best cardiovascular fitness? (1 Mark)

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1. Justify your answer for part a, using specific information that provides the answer. (2 Marks)

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1. Describe whether this is a valid experiment. (2 Marks)

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1. You read the following hypothesis in an advertisement “A regular exercise program will increase cardiovascular fitness.” After reading this you decide to design an experiment to test this hypothesis.
2. Design an experiment that tests this hypothesis, ensuring it is detailed enough to allow the practical to be replicated by others. (5 Marks)

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1. State two controlled variables and explain their effect on the data if uncontrolled (4 Marks)

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