Human Biology – General Year 12 2019

## Task 4 – Unit 3

**Assessment Type:** Investigation

**Conditions**

* 1-week at home
* 2-hours in-class

**Due Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Task Weighting :** 8%

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total : /45**

A stimulus is a change in the environment of an organism. Receptors respond to a stimulus and send impulses along sensory neurons to the CNS which figures out the correct response. Some receptors are found in the skin, other receptors can form part of complex organs. Effector organs carry out the body's responses to stimuli, and in humans are either glands or muscles. In this way, a stimuli will bring about a response from a muscle or gland.

Reaction time is a measure of how quickly an organism can respond to a particular stimulus. The model for information flow within an organism can be represented in this way: Stimulus - Receptor - Sensory Neuron- Spinal Cord or Brain- Motor Neuron – Effector – Response/Effect

**Your task is to design, plan, conduct and analyse an investigation based on factors that impact human reaction time. This task is presented in two parts.**

**Part A: Research and Planning [22 marks]**

Research and planning for investigation

**Part B: Experimentation**  **[23 marks]**

In-class experiment and data analysis of a peer’s experiment.

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**Part A – Research and Planning 22 marks**

**You need to write a laboratory report that addresses the following areas:**

* Background information (5 marks)
  + What receptors are
  + A table that summarises the name and location of receptors that detect light, sound, changes in position, chemicals, touch, pressure, pain and temperature
  + The purpose/importance of reflexes and reactions
  + The difference between reflexes and reactions in structure and function
  + An explanation of three different factors that affect reaction time
* An aim (1 mark)
* A hypothesis (2 marks)
* Your independent and dependent variables with specific details (2 marks)
* Explain three controlled variables with specific details (3 marks)
* An equipment list (1 mark)
* A detailed method of how to conduct the experiment (6 marks) [on a separate page]
* A table that will be used to collect your data (2 marks)

You will have the following equipment available to you: rulers, timers, laptops, coffee, lollies, the whole classroom space, outside.

REMEMBER: you are swapping your method with a classmate, so make sure you write a detailed method that is easy for them to follow!

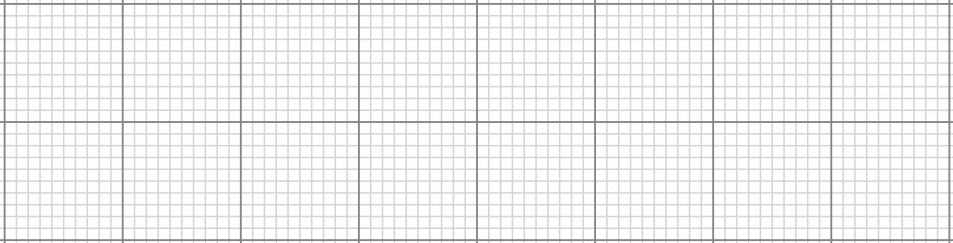
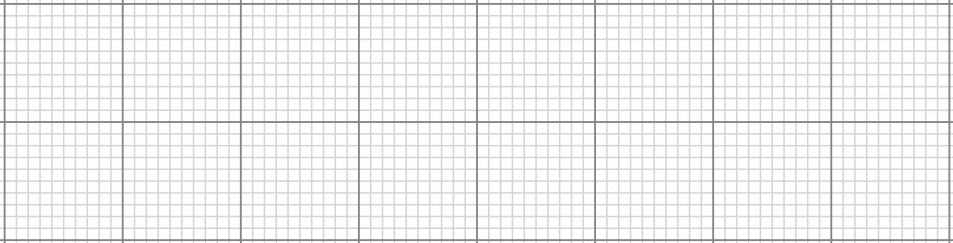
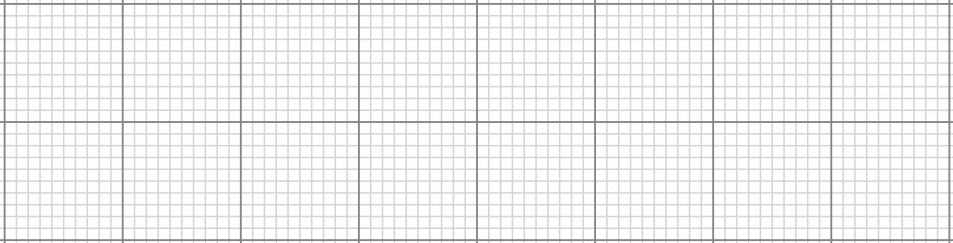
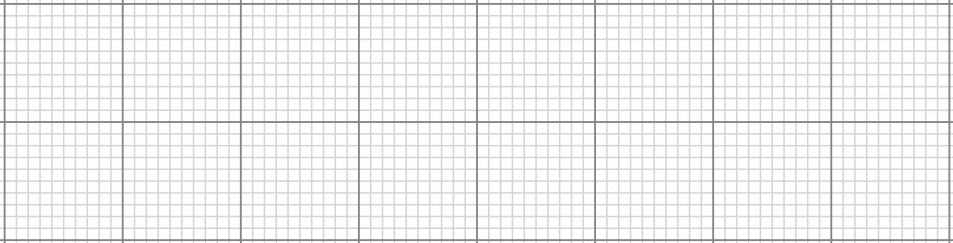
**Analysis and evaluation** **(23 marks)**

1. Write an appropriate hypothesis for the method that you have been given (2 marks)

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1. Create an appropriate table to display your data (2 marks)

1. Draw a graph of your data: (5 Marks)



1. Describe the trend and/or pattern in your data. Use data from the graph to support your answer (2 marks)

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1. Use your knowledge and understanding of the nervous system to explain the trend and/or pattern of your results (3 marks)

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1. State whether this experiment is valid. Explain your reasoning (2 marks)

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1. State two improvements to the experimental design, and explain how these improvements will increase the reliability of your data (4 marks)

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1. Write a scientific conclusion (3 marks)

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