 **12 MATHEMATICS APPLICATIONS**

**Investigation 1**

**Bivariate Data**

**Total: 44 marks**

**Due via e-submission by Monday 15th March @ 5pm**

In this investigative activity, you will be asked to carry out a statistical investigation that will involve collecting and comparing data across two groups to investigate a question.

Before an investigation can be carried out, it must be carefully planned so that data can be collected in a way that not only allows investigation of the question(s) or issue(s), but also enables exploration that might turn up interesting or important information. Hence the first step is to decide what is going to be investigated, so we can decide what data to collect. In real world projects some questions to consider in this first step include:

* *What is of interest?*
* *What are we going to observe, record or measure?*
* *Practicalities – can we collect the data we want?*
* *What are we not going to record?*
* *What conditions are we going to keep consistent?*
* *What sample size will you use (suggest at least 30)*
* *Will it be free from bias?*
* *Is there anything else we should observe or record in case its useful?*

In real world projects, these take some time, debate and thought. By using the virtual world of the Islands, what is available to be collected and how, is much more controlled, but considering the other questions is not only part of the statistical process, but also highly engaging.

**TASK**

Go to <https://islands.smp.uq.edu.au/login.php>

Type in your school email address then click [Need to set or reset your password?](https://islands.smp.uq.edu.au/forgot.php)

Go to your school email to retrieve the link to get in.

**Using ‘the Islands’ population, choose 2 numerical variables and investigate a proposition**

**about them**.

*eg.*

* *Is it possible to use the number of hours of sleep to estimate your resting pulse rate?*
* *Is there a correlation between age and reaction-time?*
* *Is there a relationship between peak flow rate and pulse rate?*

**Present your findings as a REPORT and include in your report:**

* *The question you decided to investigate.*
* *What data you collected, how you collected it including any controls you put in place.*
* *The collected data, tabulated and graphed, as appropriate.*
* *Your analysis and interpretation of the data, including mention of sample size and any bias.*
* *Your conclusions and possible further investigations.*

**APPENDIX A – Marks allocation**

***THE REPORT***

**Part A – Problem [ 5 marks ]**

* **Clearly explain the purpose of the report and identify the question to be investigated.**
* **Clarify which two variables are to be investigated, confirming which is the explanatory and which is the response variable.**

****Part B – Collect Data [ 9 marks ]****

* **Clearly describe how the data is to be collected and the sample size to be used.**
* **State any controls used in the collection method and any factors that might affect this.**
* **Present your data** appropriately and check for any anomalies.

**Part C – Analyse Data [ 9 marks ]**

* Use a variety of statistical techniques and graphical displays to gain evidence which can be used to decide whether your proposition is reasonable or not.

****Part D – Interpret & Communicate [ 8 marks ]****

* **Interpret the statistical results from part C to decide whether your proposition is reasonable or not.**

****Part E – Further Analysis [ 14 marks ]****

* **Test your conclusion from Part D by repeating the statistical investigation process in a different part of the island.**
* Use the analysis of the second data set to support or challenge your conclusion in Part D.
* Final conclusion and possible investigations that might be considered in the future.