Mathematics Methods Unit 4

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Investigation: Sampling and Sample Proportions. \_\_\_\_\_\_ / 40**

**Marking Rubric.**

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| **Task** | **Limited** | **Satisfactory** | **Accomplished** |
| Interpret the task and gather the key information | Identifies the need to conduct a survey and obtain a sample proportion. Chooses a trait to examine.  (1-2) | Identifies the need to conduct multiple surveys and obtain sample proportions of each. Research into a trait that a proportion of the population has. Chooses a valid trait to examine. Required to make judgements about accuracy of samples taken.  (3-4) | Identifies multiple samples of a population is required, where the sample proportion is to be calculated for each. Will need to conduct a number of surveys. Refers to sources of bias. Research into a trait that a proportion of the population has. Chooses a valid trait to examine. Record any sources used. Required to use course-relation calculations to judge if samples taken represent the target population accurately.  Will need to make conclusions about samples collected, maybe in the context of action needed to be taken if an issue (eg, health) is raised.  Makes any relevant assumptions.  (5-6) |
| Identify the mathematics which could help to complete the task | Identifies the need to use sampling techniques. Indicates a sample size to be used. Indicates the calculation of sample proportion for each sample will be conducted.  (1-2) | Identifies the need to use random sampling techniques. Indicates sample size is important. Indicates the calculation of sample proportion for each sample, mean and standard deviation for the distribution of sample proportions and confidence intervals will be conducted.  (3-4) | Identifies the need to use random sampling techniques. This may also include systematic, stratified sampling methods. Refers to sources of bias and how to avoid or minimise bias. Indicates sample size is important. May indicate a number of sample sizes will be investigated. Refers to variability between random samples likely. Indicates the calculation of sample proportion of each sample, mean and standard deviation for the distribution of sample proportions and confidence intervals at difference levels will be conducted. If enough samples are taken, a histogram of the distribution of sample proportions may be drawn.  (5-6) |

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| **Task** | **Limited** | **Satisfactory** | **Accomplished** |
| Analyse information and data from a variety of sources | Gains a population proportion. Obtains one set of sample data from convenience sampling (likely school only).  (1-2) | Gains a reliable population proportion. Obtains multiple sets of sample data from largely convenience sampling, however, random selection within convenience set (likely school only).  (3-4) | References where reliable population proportion information can be sourced from. Gains a reliable population proportion. Details the sources from which the samples are to be taken from. Obtains multiple sets of sample data from a variety of sources.  (5-6) |
| Apply existing mathematical knowledge and strategies to obtain a solution | Conducts a convenience sampling process with sample sizes . Calculates the sample proportion of each sample.  (1-3) | Conducts a convenience/ random sampling process with sample sizes . Calculates the sample proportion of each sample, mean and standard deviation for the distribution of sample proportions and at least one confidence interval. May include graphical displays.  (4-6) | Conducts a random sampling process with sample sizes  . Accurately calculates the sample proportion of each sample, mean and standard deviation for the distribution of sample proportions and confidence intervals at difference levels. May include graphical displays.  (7-8) |
| Verify the reasonableness of the solution | Compares sample proportions to researched population proportion and comments on the accuracy of the sample proportions as a point estimate for the population proportion.  (1-3) | Compares sample proportions to researched population proportion and comments on the accuracy of the sample proportions as a point estimate for the population proportion. Uses whether or not calculated confidence intervals for at least one sample contain the population proportion as supporting evidence. Comments on a limitation encountered.  (4-6) | Compares sample proportions to researched population proportion and comments on the accuracy of the sample proportions as a point estimate for the population proportion. Uses whether or not calculated confidence intervals, at various levels, for each sample contain the population proportion as supporting evidence. Makes comment on any limitations encountered and possible strategies to address some of those limitations if given more resources.  (7-8) |
| Communicate findings in a systematic and concise manner | Some vague language and lacks precision in some/many parts of the investigation. Lacks referencing.  (1-2) | Mostly concise and well-presented investigation throughout. Some referencing of data sources.  (3-4) | Concise and well-presented investigation throughout. Good referencing of all data sources.  (5-6) |