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| Experimental Design 3.11  Experiment:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Write on** |
| **Problem**   * Clearly state what you are going to investigate (the experimental situation.) * Use contextual and statistical knowledge informed by research to develop an investigative question. * Pose a causal relationship question that can be investigated by conducting an experiment. * Hypothesise about the results of the experiment.   **Plan**  Planning and conducting an experiment using experimental design principles.   * Identify the type of experiment to be conducted. * Identify the experimental units. * Identify the treatment variable and how it will be manipulated. * Identify the response variable and how it is measured. * Justify how the treatment variable (including levels and groups) and response variable were defined for the experiment. * Justify the allocation of the treatment to the experimental units * Identify other sources of variation (factors) and how they might affect the experiment. * Use contextual knowledge to identify relevant variables that could affect the response variable. * Use statistical knowledge to describe how these sources of variation could be controlled or balanced.   **Data and Analysis**   * Collect and record the data from the experiment, identifying any issues that arose during the experiment and how they might affect their findings. * Reflect on how the experiment was conducted, identifying key issues in the design and explaining how any design issues might be addressed. * Produce displays and statistics appropriate to the design of the experiment. * Describe key features of the displays and statistics relevant to the experiment. * Use an appropriate statistical method to obtain evidence to answer the investigative question. * Use statistical insight to justify their method in relation to the **causal relationship.**   **Conclusion**   * Make an appropriate formal statistical inference. * Assess and interpret the strength of the evidence for the inference about the causal relationship investigated. * Communicate the findings in a conclusion. * Discuss how your findings relate to other research findings. * Use informed contextual knowledge to generalise to the wider experimental situation in their discussion of their findings. |  |