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.	