



Conduct an Experiment to Investigate a Situation

Achieved	Merit	Excellence
Conduct an experiment to investigate a situation using experimental design principles.	Conduct an experiment to investigate a situation using experimental design principles, with justification.	Conduct an experiment to investigate a situation using experimental design principles, with statistical insight.
<p><u>Justification</u> - Linking components of the investigation process to the context, explaining relevant considerations, and supporting findings with evidence from the experiment.</p>		
<p><u>Statistical Insight</u> - Integrating statistical and contextual knowledge throughout, reflecting on the process, discussing variation, considering other relevant variables.</p>		

Experimental Design Principles

Investigating a situation by experiment involves:

- Posing an investigative question
- Planning and carrying out the experiment
- Selecting experimental units
- Determining treatment and response variables
- Allocating treatments to experimental units
- Determining data collection and recording methods
- Considering other sources of variation
- Selecting appropriate displays and summary statistics
- Making a formal statistical inference
- Communicating findings in a conclusion

Problems

The problems will involve using the statistical enquiry cycle and experimental design principles to investigate real-world or mathematical situations.

Key Vocabulary

Students should understand terms related to experimental design like:

- | | | |
|---|---|--|
| <input type="checkbox"/> Experiment | <input type="checkbox"/> Treatment variable | <input type="checkbox"/> Statistical inference |
| <input type="checkbox"/> Investigative question | <input type="checkbox"/> Response variable | <input type="checkbox"/> Variation |
| <input type="checkbox"/> Experimental units | <input type="checkbox"/> Data collection | <input type="checkbox"/> Context |

