Government of Western Australia
School Curriculum and Standards Authority

Western Australian Curriculum

Science

Science investigation scaffold

Years 9–10

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

Disclaimer

Any resources, such as texts and websites, that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandated or that they are the only resources relevant to the course. Teachers must exercise their professional judgement as to the appropriateness of any resources they may wish to use.

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Advice to teachers

Investigations in science follow a scientific process of answering a question, exploring an idea or solving a problem. Investigations require activities including planning, collecting and interpreting data and forming a conclusion.

The Science inquiry content is banded by phase of schooling. The Science inquiry sub-strands listed below describe the skills students should be taught in each phase of schooling from Pre-primary to Year 10.

- Questioning and predicting
- Planning and conducting
- Processing, modelling and analysing
- Evaluating

Students should also be able to communicate their findings from investigations to others. The Communicating sub-strand describes the appropriate communication skills for each phase of schooling.

This investigation scaffold has been developed for the middle adolescence phase of schooling (Years 9 –10) to guide students through the investigation process.

The choice of the approach taken when conducting investigations will depend on the type of investigation, context and purpose of the investigation. The document *Types of science inquiry investigations Years 7–10* (https://k10outline.scsa.wa.edu.au/home/wa-curriculum/learning-areas/science/p-10-science-curriculum) classifies investigations in four types based on the observations being collected and whether they include experimental variables. This scaffold should be adjusted to suit the type of investigation being conducted. For example, when conducting a descriptive investigation, reference to experimental variables should be removed and the processing data section may need to be adjusted depending on the type of data being collected.

The guidance provided in an investigation will depend on the purpose of the investigation; for example, the skills to be targeted, and student progress in the Science inquiry strand.
Students may:

- be provided with the guidance on the independent variable being tested; for example, how does load carried affect the force of friction? They may or may not be provided with more information depending on the amount of guidance
- be provided with a general question or problem and then select the independent variable for their investigation; for example, what can affect the force of friction?
- investigate anything they choose.

The table below illustrates how the amount of guidance with science investigations can be adjusted.

Amount of guidance	Question or problem	Equipment	Method
Guided investigation	Provided	Provided	Provided
Open guided investigation	Provided	Provided	Open
Open guided investigation	Provided	Open	Open
Open investigation	Open	Open	Open

Science investigation scaffold Years 9–10

Student name: _____

Group members: _____

Investigation title: _____

Background research

Provide clear and detailed explanations of relevant scientific concepts or models in relation to this investigation.

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Questioning and predicting

Propose an investigable question for the investigation.

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Propose a hypothesis for the investigation.

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Planning and conducting

Identify the independent and dependant variable in the investigation and describe how the variables will be changed and measured.

(a) Independent variable (variable being changed)

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(b) Dependent variable (variable to be measured)

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Identify the variables to be controlled in the investigation and describe how each variable will be controlled.

List the equipment required for the investigation.

Conduct a risk assessment for the investigation. Complete the table below identifying potential hazards and describe the risks and strategies to reduce risks.

Hazard	Risk	Strategy to reduce risk

Identify ethical issues that need to be considered and describe how these will be managed.

Outline the method for this investigation. Consider the sample size, validity, reliability and reproducibility.

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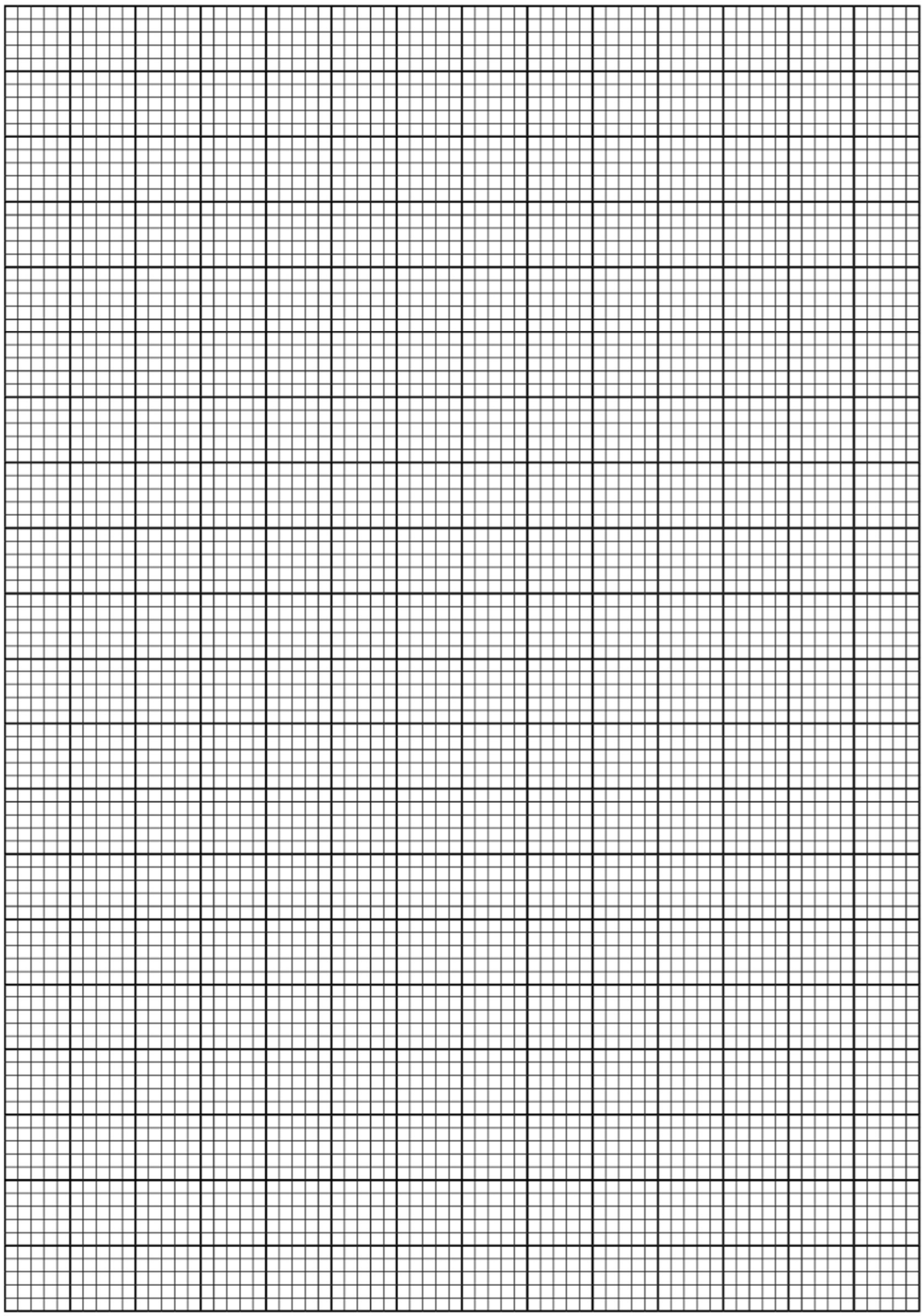
Draw a labelled diagram or provide a digital representation of the equipment set-up.

Processing data

Represent the data in an appropriate format.

Processing data

Represent the data in an appropriate format.



Analysing data

Identify and explain any anomalies in the data collected.

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Describe the patterns or relationships shown by results.

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Explain the patterns or relationships using relevant science concepts.

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Draw a conclusion for this investigation. Support the conclusion using data from the investigation.

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Evaluating

Reflect on the validity and reliability of the investigation method and identify possible sources of error.

Validity: Describe whether the investigation measured what was intended to be measured.

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Reliability: Describe whether the results were consistent for each repeat/trial.

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Possible sources of error.

Describe ways the quality of data could be improved.