NSW Bushfire STEM Poster Competition - TIPS

Participation in this competition is voluntary.

This document provides ideas for:

- **bushfire-*related* topics**
- **investigations**
- **how to undertake an investigation**
- **producing an interesting and well-received poster**

This document should be read in conjunction with the 'Judging Criteria' document

Ideas for bushfire-*related* topics

Whilst the focus is on bushfire-related investigations and the use of data to inform and advance knowledge and skills, posters may relate to:

- Bushfires
- Environmental sustainability
- Other related topics such as, but not limited to:
  - 'Natural Disasters' (floods, storms, etc)
  - 'Emergency Services'
  - 'Indigenous practices surrounding the bush and its management'
  - other similar topics

as such may also inform, and thus relate to understanding and/or improving, *bushfire* management, prediction, risk mitigation, preparedness, prevention.

Ideas for investigations

Data sources may be either primary (collected by students) or secondary (previously published) – if the latter, the source must be cited in the poster.

Examples of aspects to investigate include, but are not limited to:

A. Preparedness for bushfires / bushfire awareness / testing knowledge of bushfires (frequency, or impact, or other) / familiarity with Indigenous practices surrounding the bush and its management, etc

Perhaps conduct **surveys** surrounding the above, or other aspects, and compare results across school grades, or adults v students, or across other points of comparison.

B. Undertake **research** of existing information - become familiar with and report on:

a. Best practices surrounding bushfire (or other) management, prediction, risk mitigation, preparedness, prevention / Indigenous practices surrounding the bush and its management / …

b. Bushfire-related, or other (e.g., environmental sustainability 'carbon footprint') apps (or info)
   - Perhaps compare apps (or info) – either the team members' assessment, or inform others about the apps and conduct a **survey** of opinions about the relative value of such apps

c. The impact of bushfires (or floods, or…) – Collective Trauma / mental health, financial, physical (people / homes / environment / flora / fauna)

d. The frequency of bushfires (or floods, or …) – what can be learnt from past bushfires, what patterns exist, etc?

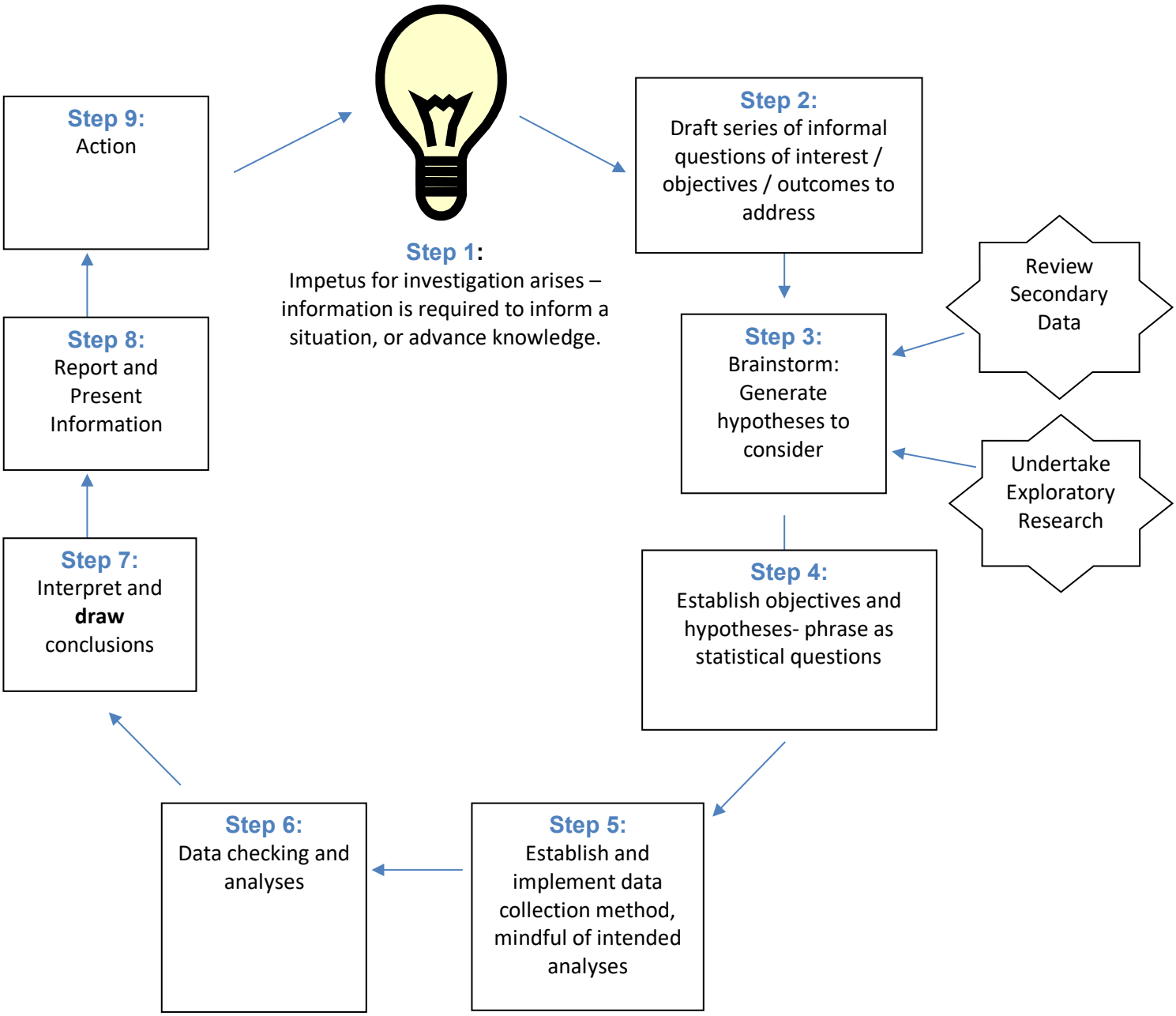
e. The primary issues or failures when it comes to managing, predicting, preparing for, preventing bushfires (or floods, or…)

How to undertake an investigation

A well-considered plan will improve the likely value and success of your project.

Consider visual cues such as the *Problem – Plan – Data – Analysis – Conclusion* Investigative Cycle

An alternative visual display of the general investigation or research process (adapted from Howley and Gerlach, 2006) is also provided below



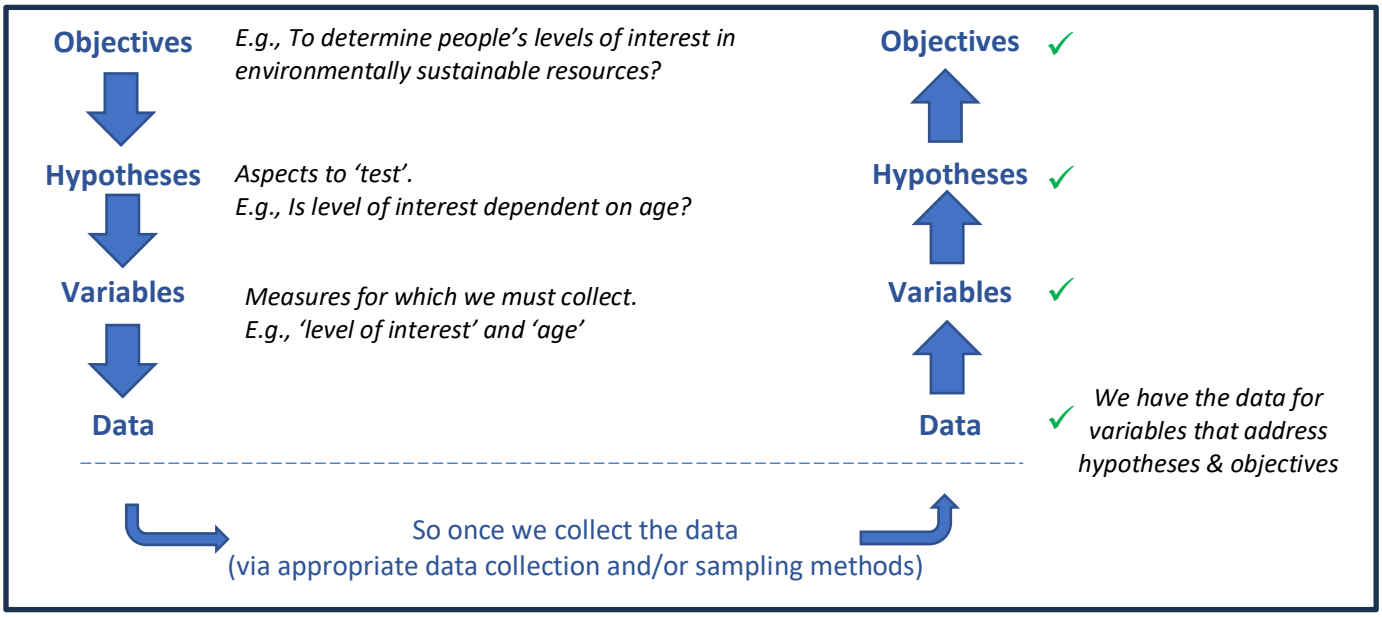
Fundamental to any research or investigation being successful is:

1. Clarifying:
   - *what is its purpose?*
   - *what are the aspects of interest (or questions) you want to address or answer?*
2. Turning the latter into aspects that are well-defined and measurable.
3. Stating in a form for which data may provide an answer.

Essentially, establishing well-defined, measurable and answerable objectives!

The following figure provides a simplified visual overview of why clarifying objectives and hypotheses is critical:

Basically, establishing clear objectives and hypotheses **identifies the variables for which data** are required … **data which ultimately will then address the hypotheses and objectives!**



Plan the work and work the plan

A well-considered plan will improve the likely value and success of your project. Consider the following:

1. What aspects and types of investigations may interest you, your team, and others viewing the poster?
2. What key question/s will you address; have you hypotheses to test – can they be quantified?

   Example hypothesis: 'Grade 10 students are more familiar with bushfire preparation methods than Grade 8 students' – survey may then test such.
3. Can quantitative data be obtained, within your personal constraints and those of the project, that will help you to answer such aims, questions or hypotheses?
4. Should, or could, you involve comparisons of groups (e.g. males versus females; between age groups or school classes; etc.) and in what ways may the groups be compared?
   - Including such may raise the interest and value of your project
5. How repeatable is your project – could someone apply your methods and obtain similar results?
   - Consider validity and reliability, along with the importance of replication (and sample size) and not having a biased sample or recognising such.
   - How have you considered and mitigated the effects of variation?
   - How generalisable will your results be? Will any data you collect address your intended aim?
   - Will everyone involved in collecting data use the same method of measurement and is it the best measure?
6. Consider balance – will you be best to report something graphically or via a table or text?

Ideas for producing an interesting and well-received poster

Reading the **'Judging Criteria'** document will also assist.

Without simply advising of all the key elements to include, you should consider aspects like:

- **Title** – informative (identifies what the viewer may expect the poster to be about or contains) and interesting (piques interest perhaps through humour or clever play on words)
- **Background** – contextualises the study, providing the viewer an understanding of why the investigation was undertaken or how it may be valuable.
- **Aim** – clarifies the purpose and what will be answered or addressed by the project.
- **Hypotheses** – identifies aspects that will be tested by the investigation (e.g., if a certain relationship exists); try to not simply state a hypothesis for the sake of having one, only do so if it adds to the quality of the project.
- **Methods** – describes how the investigation was conducted such that the reader could repeat the study themselves, or check the appropriateness of your methods for collecting or collating data/information. This should also include any methods for analysis that will be used.
- **Results** – a blend of visual displays, tables and text reporting on the data analysis, ensuring that they each, and together, provide a best clear message.
- **Discussion** – interpretation of the results, recognition of any limitations and why you were unable to overcome them or how the study could be improved.
- **Conclusion** – clear, correct, valuable key take-home messages which address the aim, and any future recommendations.
- **References** – where appropriate, e.g., secondary data sources used.
- **Aesthetic appeal** – consideration of the overall visual appearance, layout and balance of the content, and how someone walking by a series of such posters be drawn to and interested in your poster. Is your poster presentation adequately appealing and informative?

You may like to view past winners of the National Schools Poster Competition (NSPC) and additional resources available from the NSPC website – please note that any topic is permissible in the NSPC!

Thank you for your consideration of this competition. We hope to bring valuable and enjoyable hours of learning to students and teachers.

Professor Peter Howley

Vice President – Hunter Innovation and Science Hub

Chair of Statistical Education – Statistical Society of Australia