INVESTIGATE & EXPERIMENT

Plan Your Own Investigation

The Challenge

Use this step-by-step guide to plan and conduct a scientific investigation based on a question you choose.

1. Choose Your Question

Get together with your team and pick a question from the Investigate & Experiment category of the Rezource Force Challenge Menu or come up with your own!

If you get stuck, STEM is all about following your interests, so choose something that grabs your attention, connects to your world, or makes you wonder how it works.

2. Conduct Research

Before testing something, it helps to understand how it works. A good investigation starts with some background knowledge. Do some research to explore the science behind your chosen question.

3. Write a Hypothesis

Your hypothesis is an idea that explains what you think will happen and why. It must be something you can test through an experiment. Use this sentence starter:

I think _____ will _____ because _____ .

4. Identify the Variables

A controlled experiment is when you change one thing (independent variable), measure one thing (dependent variable), and keep everything else the same (controlled variables).

- **Independent Variable:** What are you changing?
- **Dependent Variable:** What are you measuring?
- **Controlled Variables:** What needs to stay the same?

Use a table like the one below to document your variables as you plan your investigation:

What will I keep the same?	What will I change?	What will I measure?
Controlled variables	**Independent variable**	**Dependent variable**

Adapted from: Hackling, MW 2005, *Working Scientifically: Implementing and Assessing Open Investigation Work in Science*, Department of Education and Training, Western Australia.

5. Make a Prediction

Make a prediction about what you expect to observe or measure during the experiment. Give reasons for your prediction.

You can begin with: I predict that...

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6. Plan Your Experiment

What steps will you take to keep your test fair?
Write your method in clear, numbered steps.
Draw a labelled diagram of your setup to help explain how your test will work.

7. Conduct the Experiment

Follow your plan carefully. Use your equipment safely. Repeat your test if needed to get accurate results.

Take photos and videos to include in your presentation at the STEM Expo!

8. Record the Results

Pick a format that clearly presents your findings such as a line graph, bar chart, or table.

9. Analyse the Results

Analysing results helps us understand what happened in our experiment and why. It shows you if your prediction was correct, helps you spot patterns or mistakes, and gives you clues for what to try next. Look closely at your results and create responses to the following questions:

- Do you notice any patterns?
- How do you explain the patterns?
- What did your results show you about the question or hypothesis that you are investigating?
- Did anything unexpected happen?
- How could you improve your method?

10. STEM Expo

Use one of the following formats to present what you discovered through your investigation at the STEM Expo! It could be a scientific report, slide presentation, video explanation or a podcast. Remember to include:

- Your question and hypothesis
- Photos or diagrams of your setup
- Your data (tables, charts, calculations)
- What you found out and why you think it happened
- Any improvements you would make next time

11. Showcase @ rezourceforce.com.au

Now you can share your project with the REZource Force Online Showcase. This is your chance to show your work to other schools, community members, and professionals working in the renewable energy industry.

Selected entries will be eligible to win prizes for their school!

To enter, use the QR code to fill out a short form and upload photos, videos, or documents that show what you created and discovered.

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