

Avonhead School Science and Technology Fair 2018

Aim: Begin the science/technology investigation for the Avonhead School Science & Technology Fair 2018

This is an opportunity for you to **follow the procedure of a science investigation or develop a solution to a problem (technology)**. It also gives you the chance to enter the NIWA Canterbury-Westland Schools' Science Fair and even have some experts become really interested in your results!

This term you will complete all of the steps below ('Basic Scientific Method') of this science investigation. Over the next week you will need to take the first step of the method – 1. Ask a question.

Basic Scientific Method

1. Ask a question – what you need to come up with **BEFORE WEDNESDAY 30 May, WEEK 5, TERM 2**

These other steps happen from WEEK 6, Term 2 onwards (no need to complete them just yet)

2. State a hypothesis (make a guess what will happen)
3. Plan the experiment
4. Perform the experiment and make observations
5. Analyse the results
6. Reach conclusions

1. How to come up with a question?

Start with a **real life problem**. What do you find annoying in your daily life? For example:

- Your supermarket doesn't have a tasty gluten-free ice cream.... you could develop a recipe for a tasty g-f ice cream.
- Sand flies – the repellent you use is too toxic. Are any of the 'natural' ones as effective?
- You can never find a good, safe route to cycle to school.... you could develop an improved signage system to help students find cycle routes to school.

OR

Start with a **question** that you want an answer for...something that interests you or makes you wonder. The question can be about microbiology, maths, chemistry, biology, physics, sustainability etc.

For example:

- What if we didn't bother to control pests like possums and stoats or wilding pines?
- How could we get around if oil was no longer available?
- Would I get enough variety in my diet if I only ate locally or seasonally?

OR

Complete the 'How to get a good idea for a project' questionnaire to help spark some ideas – this is at end of this explanation.

NOTE: Good science is about finding out what the problems are and testing innovative ways to solve them.

It's the solution that counts in the end!

Also think why is this important?

Who or what will benefit?

Possible websites to help with a topic are:

<http://christchurchcitylibraries.com/Kids/ScienceFairs/> or

<http://chemistry.about.com/od/sciencefairprojectideas/a/environmentsci.htm>

<https://sciencebob.com/science-fair-ideas/ideas/>

2. Brainstorm and type up ALL of your ideas and questions in your log/doc.

A log is a very important part of your investigation. Used properly, your log contains a detailed and permanent account of every step of your project, from the initial brainstorming to the final data analysis. What to do: Create a doc called **Science Investigation** and save this in the science folder.

3. See whether your ideas or questions fit into one of the three categories for a Fair.

- **Experimental Research:** a project that involves a controlled experiment [i.e. in biology, chemistry, physics]
E.g. which brand of battery lasts the longest? – Please don't do this though!
- **Technology Development:** this is where your idea involves creating or designing something to help people, make life easier or improves the environment:
E.g. inventing a new, more effective way of controlling possums
- **Research to increase knowledge for environmental or social systems:** this is where your idea is tested by gathering and analysing data instead of using controlled experiments, such as doing a survey:
E.g. finding the safest cycling routes to school

4. Finally, choose one idea that really interests you and answer the following:

- Does my idea fall into one of the three categories? Which one?
- Can I design a method (the steps you will take to investigate) that is feasible?
- Can I finish the project within a few months, in order to meet the deadline (Week 2, Term 3)?
- If I have to buy equipment to do the project, will it be cheap?
- Is the project appropriate for my year level?
- Will I really enjoy finding out the answer or the solution?
- Is it beneficial to others, the environment etc.?

When you answer 'yes' to all seven questions above and are satisfied with the idea, then write the question/topic and the category on your doc/log and share it with your homeroom teacher

What's the point of this task?

- I need to devise a question/topic for the Avonhead Science and Technology Fair 2018 over the next week
- I need to begin my log/doc to show the steps in my investigation

I will know I have been successful with this task when I have:

Shared my question/doc by WEDNESDAY 30 MAY

How to get a good idea for a project

Good ideas for projects come from things you are interested in.

Try the ideas below:

Idea 1: *Jot down all the things you choose to do in your leisure time. Is there a problem with any of them, for instance listening to music uninterrupted by other noises; carrying gear on your bike; refilling the dog's water bowl?*

What activities do you do?

Are there any problems related to any of them?

Idea 2: *Is there a question you've wondered about, such as the health of your local stream, bush or air; how good is thermal underwear; what plants do sheep prefer; how quickly can people learn words from another language; how much water can soil hold?*

What have you ever wondered about?

Idea 3: *Can you see an opportunity to develop a product? It might for instance be a device or system to clarify cowshed effluent, game to help children learn basic maths, or a better way to store CDs, a kit for making kites out of supermarket shopping bags or a chimney filter to reduce smoke emissions*

What's your product idea?

Idea 4: *Is there a need you think should be addressed?*

It could be something like preventing cats getting at birds nests; encouraging people to save water; making a dangerous corner in a school corridor or on a cycle track safer; dealing with smelly socks; or protecting colour photos on display...

What is a need you have seen or have thought of?

Idea 5: *Does someone you know have a problem you could help with? It might be how to get rid of a weed in a reserve area; a way to keep a baby occupied while a parent is busy; or a way to carry a hockey stick on a bike...*

What is a problem you have seen that you can help with?

Idea 6: *Is there a local environmental issue? It may be that an area of the school needs redesigning, or that the local stream is polluted...*

Do you have a local environmental issue?

Idea 7: *Is there something you have done at school you would like to follow up and find out more about, or do differently?*

What would you like to follow up?