**Researching bacterial cultures and antibiotics**

**Levels:** 6 **NoS achievement aims:** Understanding about science   
**Topic:** Health **Contextual strands:** Living world

**Rationale**

Some fungi secrete chemicals that inhibit the growth and reproduction of certain bacteria.

While researching the work of Alexander Fleming (1928), students will discuss the role of creativity and insight in scientific discovery. This can be compared with their own experience of experiments that give unexpected results.

**What you need**

* Bacterial agar plates that have been inoculated, contaminated with fungi, and incubated. Ministry of Education safety guidelines should be followed (see activity resources below).
* Alternatively, use photographs of bacterial cultures on agar plates, one with an antibiotic fungal colony.
* Literature on the work of Alexander Fleming on antibiotics. Approach the National Library, Advice and Services through your school library. Inform them of the required reading level.

**Focus**

* What are antibiotics? When are they used and how are they made?
* What prompted Fleming to investigate these chemical substances in 1928?
* What is our usual response when an experiment ‘goes wrong’, that is to say, gives unexpected results?

**Exploration**

1. In groups, give students access to the agar cultures (or photographs). If you give them sealed bacterial plates, provide the appropriate safety instructions.
2. Discuss with them what is supposed to happen when we make pure cultures of bacteria and have them share their ideas about what the problem might be with the batch in front of them (or in the photographs).
3. In groups, have them discuss what they would do if this were their own experiment and report back to the class.
4. Introduce the name and a very brief biography of Alexander Fleming. Suggest he had a role in the discovery of antibiotics and pose the question, ‘What prompted Fleming to investigate these chemicals in 1928?’
5. Have the class develop research focus questions related to Fleming’s work and plan a bibliographical search.
6. Help the students, in groups, to use the library and Internet to obtain relevant information.
7. Have each group report back to the class on what they believe triggered Fleming’s discovery of penicillin.

**Reflection**

* If Fleming did not set out to discover penicillin, what made him start the research?
* What might have been the consequences for our generation if he had discarded the contaminated plate, as many had before?
* Reflect on how you last dealt with an experiment that did not do what you expected it to do.
* If it were possible to cultivate a creative, insightful researcher how would you suggest they be trained?

**Supporting Activity resources**

Ministry of Education (2000). *Safety and Science: Revised Edition: A Guidance Manual for New Zealand Schools*. Wellington: Learning Media.