

# APPLICATIONS IN ACTION



## Applications in Action

This pamphlet outlines the Applications series of books, including some titles you may know and others that are new to you. The Applications series provides real-life stories that appeal to students in years 9–11.

Often set within a New Zealand context and always linked to The New Zealand Curriculum, these richly illustrated books bring to life various aspects of science and technology. Their contexts span traditional science disciplines, and they can be used to explain key techniques or to support general understanding within a particular topic.

Applications books give students an opportunity to explore both formal and popular styles of science and technology writing. An Applications book has a two-part structure, made up of a core narrative written in a journalistic style and breakouts, which are more formal in tone and content and amplify and explain the key science and technology ideas that arise in the narrative. Teachers' notes that encourage student-led activities and learning experiences support the series.

## EXAMPLES OF STUDENTS' BOOKS

### TAKAHĒ: BACK FROM THE BRINK

*Takahē: Back from the Brink* features three very interesting people: Sophie Smith, a fourteen-year-old from rural Southland who raised \$150,000 to support the Burwood Takahē Rearing Unit near Te Anau – and became the “face” of a national campaign in the process; Ross Curtis, manager of the captive breeding programme at Burwood; and Dr Geoffrey Orbell, who in 1948 discovered a small population of takahē in remotest Fiordland. After seventy years of supposed extinction, the takahē's rediscovery was a national sensation.

The book describes the takahē's natural life history and compares it with Burwood's hi-tech captive breeding programme, which emulates natural processes (with a much lower mortality rate!). Other interventions are described, including the banding and electronic tagging of wild birds, which contribute to a regular population census.

### LIPS, LIPIDS, AND LOCKS

*Lips, Lipids, and Locks* is a four-article anthology that highlights projects in which students use essential oils in new cosmetic and hair products. “Something Wild” tells of Glen Eden Intermediate's Wild Lippy project, which turned into a company that produces and markets lip glosses and chap sticks. In “Hair's Your Gift”, students at the Marlborough Technology Centre develop a wide range of products to suit specific hair types. The two science articles in the anthology explain hair and skin structure and explore why plants produce essential oils.



### THE GIFT OF RONGOĀ

*The Gift of Rongoā* explores the field of traditional Māori medicine, or rongoā, using three case studies. The first profiles Reverend Heitapeka Tautau, or Nanny Peka as she's known by her students at Turakina Māori Girls' College. Nanny Peka is an expert in rongoā Māori.

The second section profiles Suzanne Aubert, a nineteenth-century nun, who based many of her famous remedies on rongoā Māori. Mother Aubert's story is an extraordinary case study of bicultural medical practice in colonial times.

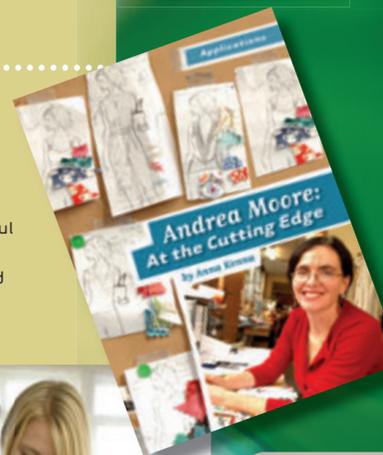
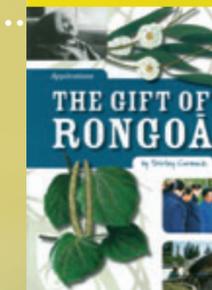
The third section explores rongoā Māori in a modern, commercial context – that of Tairāwhiti Pharmaceuticals, an iwi-owned company that has been extracting East Coast manuka oil since 1992 and promoting its powerful antibiotic properties.

### ANDREA MOORE: AT THE CUTTING EDGE

*Andrea Moore: At the Cutting Edge* profiles a well-known New Zealand fashion designer. The main narrative explores Andrea's early motivation to pursue a fashion career and describes how she eventually established her own business in this highly competitive sector. As the narrative approaches the present day, readers learn how Andrea develops a clothing range – from the initial inspiration that defines her theme to a fully-fledged collection of garments. Like all successful designers, Andrea balances a complex array of priorities. Creative flair is high on the list, but where clothing is concerned, appropriate fabric combinations, cut, and finish are crucial practical dimensions – and any designer who ignores commercial marketability will need a second income!

In terms of technology education, the book focuses on technological practice; technical concepts and processes; the characteristics of different types of knit and weave; the who and how of creating a small sample range, compared with commercial production of the final collection; and the logistics of designing and manufacturing two collections a year.

The science focus is on fibres. A series of breakouts explores the origins and properties of natural, synthetic, and regenerated fibres, yarns, and fabrics.



## TEACHER SUPPORT MATERIALS

Each Applications book is distributed with a detailed set of science and technology notes for teachers.

### THE SCIENCE AND TECHNOLOGY NOTES

The notes begin with a brief section of background information, followed by a set of student activities presented under topic headings. The introductory section also includes a discussion of links between the book in question and other books in the Applications series. This highlights opportunities for students to approach a topic from different angles by accessing a range of Applications titles.

The learning experiences in the notes combine hands-on, student-led outcome development with the exploration of important theoretical dimensions – all springing from the high-interest context presented in the students' book. Activities presented are of two types: briefly described and fully described. The briefly described activities are listed as bullet-point summaries. The fully described activities include the following details:

- links to science achievement objectives at levels 3–6 of *The New Zealand Curriculum*
- a list of specific learning intentions
- a list of the materials and equipment needed: What You Need
- a list of steps the students will need to carry out: What You Do
- assessment advice to help you gauge whether the learning intentions have been fulfilled: What You Look For.



## APPLICATIONS IN THE CLASSROOM

### TERRY BURRELL (SACRED HEART COLLEGE) DISCUSSES HER USE OF APPLICATIONS

*Every teacher faces the challenge of encouraging students who have a wide variety of interests and literacy skills. I've found the Applications series of booklets a terrific resource for "hooking in" a diverse range of students in a huge variety of teaching units.*

These books tell real-life stories, they don't just deliver factual information. Their contexts are often New Zealand based, and they have a strong Nature of Science character about them. They are beautifully formatted to appeal to the youth reader, yet they have enough hard science to extend thirsty minds. Perhaps their biggest virtue is their brevity. They are a quick read, so make an ideal starter from which a diverse group of students can branch out into new directions depending on their interests and abilities. Another strength of the Applications books is the way they create clear connections between the all-to-frequently atomised teaching areas, linking biology, chemistry, physical science, technology, and social issues. This makes them an ideal resource for the busy teacher keen to generate that "can do" attitude in a differentiated classroom.

*In order to convince your biology students that the details of respiration really are relevant, get them reading Shooting for Her Goal.* This story of an eighteen-year-old netballer's quest to be a Silver Fern makes forays into biomechanics, nutrition and training programmes, muscle function, and anaerobic and aerobic respiration as they relate to an athlete. As a way of sparking interest in an otherwise dry topic like respiration, this book is a miracle.

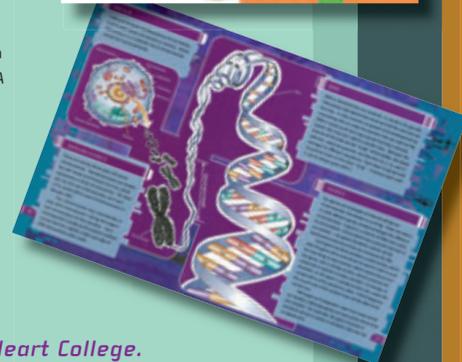
*Teaching biotechnology in biology can be the highlight of the course or a very long haul.*

I've found *The Gene Seekers* the best context yet in which to teach the key techniques – gel electrophoresis and DNA sequencing. The case study of a Bay of Plenty whānau, which suffered a tragically high incidence of stomach cancer, makes a compelling scenario, rich in social and cultural issues that lend themselves ideally to discussion and debate around ethics as well as science. A quick search of the Internet provides the very latest news of this ongoing study and requires students to apply their understanding of gene expression to a current real-life local situation.

*Eye in Space is a well-thumbed title at Sacred Heart College.*

Students may meet this in year 9 to kick off the Earth in Space unit by reading about the everyday problems astronauts working in Earth orbit must deal with. They may revisit this particular book again in year 11 when they need to learn about observational techniques for their astronomy unit. The "eye in space" refers to the Hubble Space Telescope, and this book puts such complex ideas as "red shift" observation into lay terms that any student can grasp. At the same time, it throws out teasers, such as the aside about black holes, likely to entice the more receptive students to do further research. Something for everyone and an excellent glossary to clarify any technical jargon!

Terry Burrell  
Head of Science  
Sacred Heart College



## APPLICATIONS (FULL SERIES)

**Hot Metal\*** (1992, item 92216) A scrap-metal yard inadvertently distributes radioactive cobalt across four US states.

**Born too Soon\*** (1992, item 92217) A premature baby fights for life.

**Near Miss\*** (1992, item 92218) A mid-air collision over Auckland is narrowly averted.

**Diving for Gold\*** (1992, item 92219) Salvage experts recover treasure from the wreck of the *Niagara*.

**Mountain Challenge** (1993, item 93209) Mountaineers attempt New Zealand's twenty-nine highest peaks.

**Waka\*** (1994, item 94204) Ancestral Pacific voyages are recreated in exacting detail.

**Free Fall** (1994, item 94104) Daredevils attempt a world-record formation sky dive.

**Rescue on Campbell Island** (1994, item 94119) A meteorologist fights for his life after losing a forearm to a great white shark.

**Cup Fever** (1996, item 02983) New Zealand wins the America's Cup for the first time.

**The Hostages** (1996, item 02984) An aggravated drug heist is a high-stakes test of police equipment and personnel.

**Right on Track** (1997, item 20567) An Airways Corporation team calibrates navigation systems across the Pacific.

**Time on Ice** (1997, item 20569) Antarctica New Zealand attempts to preserve Scott's hut, a fragile survivor from the heroic age of exploration.

**Eye in Space** (1998, item 21243) The Hubble Space Telescope undergoes delicate repairs.

**Sounding the Waves** (1998, item 21278) Locals rush to save hundreds of whales that have beached in Golden Bay.

**Rumbling Gut Rescue** (1999, item 23677) Grace Gibson lies trapped in Rumbling Gut Cave far below the pastures around Waitomo.

**Making Tracks** (2000, item 23873) Wellington band Fur Patrol record a hit album.

**Shooting for Her Goal** (2000, item 23874) Jodi Tahuna makes her first bid to join the Silver Ferns.

**Restoring Tissot\*** (2001, item 12938) After an armed robbery, a Victorian art treasure is recovered – in a severely damaged state.

**The Gene Seekers** (2001, item 12987) Otago medical researchers identify the mutant gene that's plaguing a Bay of Plenty whānau with stomach cancer.

**1, 2, 3, GO!** (2002, item 24737) Life changes radically for Susan and Glen when an ultrasound test reveals triplets.

**Power to the People** (2002, item 24739) In 2000, the world's first Māori-owned geothermal power plant hits full steam.

**Charged!: MacDiarmid's Electroplastic** (2003, item 27370) New Zealander and Nobel laureate Professor Alan MacDiarmid revolutionises the world of plastics by inventing semi-conductive polymers.

**Solar Challenge** (2003, item 27389) Wellington high school students race across the outback in solar-powered cars.

**Discovering Our Ancestors** (2004, item 30056, also available in Māori and Pasifika languages) From the Orient to Oceania, researchers trace the early history of Pasifika peoples.

**Hawaiki** (2004, item 30058, also available in Māori and Pasifika languages) Descendants of the Lapita people journey out from "the cradle of Polynesia" to the furthest reaches of the Pacific.

**The Gift of Rongoā** (2005, item 30847) Traditional Māori medicine is explored in historical and contemporary settings.

**Lips, Lipids, and Locks** (2005, item 30849) Young technologists take on the challenges of the appearance industry with a variety of new cosmetics and hair-care products.

**Andrea Moore: At the Cutting Edge** (2006, item 31252) From concept to collection, a Wellington fashion designer launches her latest range.

**The History Makers** (2006, item 31253) In three New Zealand locations, scientists and technologists are recreating the past for very different reasons.

**Takahē: Back from the Brink** (2007, item 31964) Fourteen-year-old Sophie Smith is on a mission to save an endangered species.

**Watch This Space** (2007, item 31966) The formation of the solar system is described in vivid detail and readers then visit waypoints in the history of human ideas about the universe.

*Check your school science, technology, or literacy resource areas for the Applications titles shown in this pamphlet.*

*For replacement copies of this pamphlet or Applications books, contact Customer services: Freephone 0800 660 662 Freefax 0800 660 663*

\*These titles are no longer in print, but copies may still be available within your school.

Note: stocks of some titles are limited, so if demand is high, your order may be placed on backorder awaiting a reprint.

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MINISTRY OF EDUCATION  
Te Tihuhu o te Mātauranga

New Zealand Government

Take students on a  
journey to explore,  
question, and innovate.

# Applications in Action

## THE APPLICATIONS SERIES

High-impact, character-driven narratives with a science and technology focus for years 9–11

SCIENCE AND TECHNOLOGY TEACHERS,  
APPLICATIONS IS IN YOUR SCHOOL NOW!

