Healing Honey
by Philippa Werry

Overview

"Healing Honey" explains how mānuka honey has special healing properties that make it valuable for medicinal purposes. It discusses the technological experimentation and modelling that went into the development of a honey bandage to treat wounds. The article finishes with an example of a local industry, set up in a rural area, that harvests mānuka honey.

Curriculum context

TECHNOLOGY

TECHNOLOGICAL KNOWLEDGE

Technological products

Achievement objective(s)

L2: Students will understand that there is a relationship between a material used and its performance properties in a technological product.

Technological modelling

Achievement objective(s)

L2: Students will understand that functional models are used to explore, test, and evaluate design concepts for potential outcomes and that prototyping is used to test a technological outcome for fitness of purpose.

Key ideas

- Technological outcomes are made from materials.

- Materials have performance properties.

- When selecting materials for a technological outcome, the technologist considers the performance properties of each material.

- Technological modelling is when a technologist collects evidence that helps them make decisions.

- Technological modelling is an essential part of the process when developing a new technological outcome.

ENGLISH

READING

Ideas

Achievement objective(s)

L2: Students will show some understanding of ideas within, across, and beyond texts.

Indicators

- Uses their personal experience and world and literacy knowledge to make meaning from texts.

- Makes meaning of increasingly complex texts by identifying main ideas.

- Makes and supports inferences from texts with some independence.

The Literacy Learning Progressions

The literacy knowledge, skills, and attitudes that students need to draw on by the end of year 4 are described in *The Literacy Learning Progressions*.

Meeting the literacy challenges

The following strategies will support students as they engage with the information and ideas in the text. Once they understand what the article is about ("the story"), they will be able to explore the key technology ideas outlined in the following pages.

The *Connected* series includes a range of texts that provide opportunities for students to locate, evaluate, integrate, and synthesise information and ideas.

It is expected that students will read across the range of texts in this *Connected* to develop their literacy skills and their understanding of the topic.

Text characteristics

- A clearly structured article with headings that signify the information in each section and help the reader to navigate the text

- Much competing information (sections about mānuka, rongoā, and Ora honey)

- Scientific and technological vocabulary and Māori nouns that may be unfamiliar to some students.

1. FINDING THE INFORMATION IN THE TEXT

The article "Healing Honey" explains how honey made from mānuka nectar has particular healing properties that have prompted scientists to find ways to use it in the health industry.

The main ideas in the text are:

- Mānuka honey contains an ingredient from the mānuka tree.
- This ingredient has a special property that makes mānuka honey able to kill bacteria much more effectively than other honey does.
- Scientists have developed a mānuka honey bandage that helps to heal wounds.
- Māori on the East Coast have set up a company that produces mānuka honey, exploiting the native flora and providing jobs for iwi.

IDENTIFY aspects of the structure, such as the title, headings, and photographs, that will help students navigate the article and locate the information.

The section about inventing a honey bandage is the most challenging for readers. Link the text to their understanding of technological modelling, reminding them that scientists have to try out their ideas to see if they work.

MODEL ways in which the students can track in sequence the steps scientists went through to invent a honey bandage.

Let's use a graphic organiser to record in sequence how the scientists invented this bandage.

Process	Result
1. They injected honey into a bandage.	The fluids in the wound washed the honey away.

RECORDING the steps and the results of each step will support students' comprehension as they work through the article.

2. IDENTIFYING SUPPORTING INFORMATION

When the students have read the complete article, ask them to record the heading of the section they found to be the most interesting. Then ask them to record the heading of the section that they thought was the most important.

ASK QUESTIONS to draw out the idea that articles often contain additional information that provides background to or that complements the main ideas.

Read the title of the article. What clues does that give you about the main idea in the article? Why does the writer tell you all about mānuka trees? Where does rongoā fit in? Do we need to read the page about Ora honey? Why? (It shows the practical results of inventing the honey bandage, so it's interesting additional information.)

3. DEALING WITH UNFAMILIAR VOCABULARY

IDENTIFY the subject-specific words and phrases that may challenge students.

Students can **IDENTIFY** and **RECORD** vocabulary that is new to them and compile their own glossaries, adding meanings in their own words.

EXPLAIN that some words can have different meanings depending on the context in which they are used. Discuss the meaning of the adjective "poor" on page 20.

IDENTIFY and **DISCUSS** the meaning of the prefix "anti". Have the students list other words they know that have this prefix.

LIST the words on page 22 that have scientific meanings – "soaked", "injected", "ooze", "fluid", "fibres", "gel", "gelling", "agent", "solid", "flexible", "absorbs".

Support students to understand these abstract concepts. **PROMPT** them to use materials available in the classroom to model or explain the meanings of these words to the rest of the class.

Look at those paintbrushes. They're soaking in water.

This sheet of cardboard can bend without tearing. That's because it's flexible.

This sunscreen is a gel, not a cream.

Reusing terminology allows it to become an integral part of students' vocabulary.

Identify the Māori nouns. In this article, many of the nouns have a macron on the "a", indicating a long vowel sound. Explain that a macron indicates how the vowel is pronounced.

Prompt the students to locate the East Coast of the North Island on a map. Repeat aloud the names Whakaari (White Island), Ruatōria, and Waihau Bay as they search for these places on the map.

The following activities and suggestions are designed as a guide for supporting students to develop understandings about technological products and technological modelling.

Key ideas

- Technological outcomes are made from materials.
- Materials have performance properties.
- When selecting materials for a technological outcome, the technologist considers the performance properties of each material.

- Technological modelling is when a technologist collects evidence that helps them make decisions.
- Technological modelling is an essential part of the process when developing a new technological outcome.

Activity 1: *Identifying the properties of materials and ingredients*

Have the students pair up and give each pair an everyday technological outcome that they are familiar with (for example, a book, a laptop, a stapler, or a pen). Students need to be able to feel and play with the technological outcome, so photographs or just the name of the technological outcome is not enough. Try to choose technological outcomes that are made from more than one material.

In their pairs, encourage the students to explore their technological outcome and identify the materials it is made from, including those materials they might not be able to see (for example, ink inside the pen).

For each material, ask them to list words that could describe the properties of that material.

Technological Outcome	Materials	Properties
Pen	plastic	light, colourful, easy to shape
	ink	fluid, dries fast
	metal	hard, cold, strong

Activity 2: *Properties game*

Brainstorm lots of words that describe properties of materials (for example, hard, soft, smooth, waterproof) and ingredients (for example, sweet, sour, crunchy). Write each word on a separate piece of paper.

Then brainstorm lots of different materials (for example, paper, steel, wood) and lots of different ingredients (for example, flour, honey, and water).

Write the name of each material and each ingredient on a separate piece of paper.

The students can then match materials and ingredients that go together. For example, paper could be matched with "smooth".

Have the students think of a technological outcome where that material or ingredient was used and describe why that property is important. For example:

Paper is used in a book, and it needs to be smooth so that the reader can turn the pages easily.

Activity 3: *Identifying the properties of mānuka*

Reread "Healing Honey" and highlight words that describe the properties of:

- mānuka trees
- honey
- mānuka honey.

Identify the different ways that Māori used the mānuka tree. For each of the ways described, support the students to identify the properties that made it good for that purpose (for example, building – strong, paddles – easy to shape, firewood – burns slowly).

Note about teaching the properties of materials and ingredients

When describing the properties of the materials used in a technological outcome, students often describe the attributes of the technological outcome itself instead. This is an easy trap as sometimes the properties of a material (for example, nylon is waterproof) are also the attributes of the technological outcome (for example, the jacket is waterproof). Starting the exploration of properties by looking at samples of

material, separate from actual products, can help prevent this confusion. In addition, it is essential that teachers use the terms "properties" and "attributes" correctly: properties being the features of materials and attributes being the features of technological outcomes.

Activity 4: *Exploring the technological modelling for honey bandages*

Have the students read "Healing Honey" and identify the tests that the scientists/technologists did to help them make decisions when creating the honey bandage (for example, they injected honey into ordinary bandages). This is called technological modelling. Technological modelling helps technologists collect evidence that helps them make decisions.

The students can then list the technological modelling done when the honey bandage was being developed.

For each kind of technological modelling described in the article ask:

What did the scientist/technologist find out?

How did that help them decide how to make the honey bandage?

Activity 5: *Brainstorming different forms of technological modelling*

As a class, brainstorm as many kinds of technological modelling as you can. It might help to refer to different technological outcomes to spark ideas. Some examples might be:

- drawings
- plasticine models
- circuit diagrams
- prototypes
- tests
- surveys
- cardboard mock-ups
- research.

For each kind of technological modelling, identify the evidence that it could provide. For example, a cardboard mock-up can help work out the size and shape of a product.

Ask:

Do you think any of these forms of technological modelling might have been used by the scientists/technologists making the honey bandage? Why or why not?

MINISTRY OF EDUCATION RESOURCES

- www.techlink.org.nz/teaching-snapshot/Y07-10-Middle/Rongoa-Tauranga-Tech-Centre.htm
- www.techlink.org.nz/teaching-snapshot/Resource-Reviews/bitesize.htm
- www.techlink.org.nz/teaching-snapshot/Y07-10-Middle/Curriculum-activities-Selina-Paul.htm