



Cut pounamu. Photo courtesy: Simon Cox

Pounamu is highly valued as a symbol of national identity and a taonga to Māori. Pounamu reminds us of the transformational nature of tectonic collision zones. **Guest author Mike Stone** writes about this very special rock with some unique properties.

Significance to Māori

Pounamu is very important to Māori identity, a prized treasure used to make tools, weapons and ornaments. These *taonga* increase in *mana* as they pass from one generation to another. Pounamu was of such value to Māori that peace could be cemented by the exchange of valuable, carved pounamu heirlooms.

In the past such taonga were an important part of trade between Ngāi Tahu and other iwi – many of the mountain passes in the Southern Alps were traditional trails used to carry pounamu from its sources. Other pounamu was carried away along the coast in waka.

The pūrākau of Poutini tells a traditional story of pounamu. Pounamu features in placenames too. *Te Wai Pounamu* / the greenstone waters is one name for the South Island, while *Te Tai Poutini* / the tides of Poutini is a name for the west coast.

Ngāi Tahu are the legal owners of all pounamu in their rohe and are responsible for ensuring it is sustainably managed. They care for the stone and protect and advocate for the rivers it comes from, the artists who shape it, and the communities that surround it. The *mātauranga* around pounamu belongs to Ngai Tahu.

Only Ngāi Tahu can collect pounamu legally from rivers and streams and only what can be carried

unaided. Others can fossick for and keep small pieces of pounamu, but only on designated West Coast beaches. People caught illegally extracting this taonga by helicopter were prosecuted and jailed.

Pounamu has long been regarded as a tapu part of te ao Māori, under the protection of ngā atua. Pounamu is a mauri stone, possessing its own *wairua*. Linked to *maunga* and Papatūānuku and reflecting Māori connection to ancestors, pounamu symbolises identity; it is much more than just a rock. It is *tikanga* to bless pounamu before it is worn to remove the *tapu*. It is also important to show respect to the *taiao* the pounamu is taken from, the *taonga* itself and its *mana*.

Classification

Jade, greenstone and pounamu are terms that tend to be used interchangeably, but in fact there are subtle differences.

Pounamu comes in two main forms nephrite (a jade) and bowenite (a serpentine). However, jade has another form, jadeite, not found in Aotearoa, so jade is not always the same as pounamu.

Greenstone is a generic term used for different and unrelated green rocks from many countries. However, this rock is unusual, as both jade and pounamu are mostly made of one mineral, whereas other green rocks can be made from many different



Map showing sources of nephrite and tangiwai (bowenite) in Te Wai Pounamu (South Island), Aotearoa.

Source: *Te Ara The Encyclopedia based on Beck, Mason 2002*

Pounamu comes in a range of colours and patterns. Māori gave each pounamu type an identity that corresponded to the world they lived in. More common ones include Kawakawa (after the shrub), Tangiwai (tears), inanga (whitebait), kahurangi (clear sky), kokopu (fish), totoweka (bush-hen blood), flower jade, pipiwharauoa (shining cuckoo), raukaraka (karaka leaf).

The chemistry

Nephrite is made from calcium magnesium silicate with a mix of tremolite and/or actinolite, eg. $\text{Ca}_2(\text{Mg}, \text{Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$. These minerals are microscopic needle-like crystals in a felted, fibrous texture.

Bowenite is softer than nephrite with different minerals. Pounamu (and jade) both contain varying amounts of iron and chromium, which account for the range of shades, the richness of the green, and its translucency.

Simon Cox, a geologist at GNS Science who has worked with pounamu for over 20 years, says "To me, personally, the term pounamu has a distinct meaning – it is māori name that encompasses both the *wairua* / spirit of the stone, as well as the mineral material we define using science. I tend to think of the word pounamu as including both nephrite and bowenite minerals, but having an added *wairua* or spirituality

minerals.

Both local pounamu and imported jade are carved and sold in NZ. Ngāi Tahu has developed a local pounamu trademark so that people can buy genuine stones from Aotearoa. This carries a *wairua* with it not available in imported stone.

associated with people's interaction with this iconic natural treasure."

Formation

Pounamu is a metamorphic rock, formed by heat and pressure deep underground. It occurs in layers or reefs in mountain bedrock, usually near rocks rich in iron and magnesium.

Nephrite is the most common type of pounamu. It forms when two contrasting rock types, such as greywacke (a hard, dark sandstone) and dunitite (a greenish igneous rock), react together under high heat and pressure, at least 10km deep in the crust.

Bowenite is a rare, older type of pounamu, found only in Fiordland. It forms from igneous rock that has been changed by heat and pressure.

Pounamu-bearing rocks were raised to the Earth's surface by movement on the Alpine Fault, a plate boundary along the Southern Alps. In the last 12 million years the Southern Alps have been uplifted by an amazing 20 km. Geologically this is very rapid and has brought faulted rock from deep down to the surface where it cooled. Once uplifted and exposed, pieces of pounamu were eroded out of bedrock, then were further eroded by glaciers and rivers, and carried down to river plains and coastal areas. So pounamu is now typically found in rivers or scattered along the coast.

Properties and uses

The Pounamu is prized for a number of properties:

- **Hardness:** Nephrite is graded at 6.5 on Mohs scale (bowenite 5, quartz 7, diamond 10). A rock can only be cut or smoothed by a harder rock.
- **Strength:** The tremolite minerals are fine-grained and fibrous, making pounamu tough and resistant to fracture. This means pounamu can hold a sharp edge, but also means it takes considerable effort to cut, shape and polish.
- **Rarity:** Nephrite occurs only in narrow zones in the bedrock, and can be found mostly as pebbles in glacial and alluvial deposits.
- **Appearance:** Pounamu are typically greenish in colour, although white, orange and black colours are also known from Aotearoa. It is translucent (especially when cut and polished) and has a bright lustre.

Pounamu has been used as:

- Tools to carve and shape wood; eg. adzes, chisels, gouges, knives, scrapers, awls, hammer stones, and drill points.
- Hunting tools; eg. hooks, spear points, leg rings to catch birds.
- Weapons; eg. mere and patu (short-hand clubs)
- Ornaments; eg. hei tiki /pendants, ear pendants, and cloak pins.

Working pounamu



Working pounamu: cutting a groove, smoothing the surface, drilling a hole.

Courtesy: Mountain Jade

Pounamu is often found as boulders or large slabs which need to be cut up, shaped and polished for use. These days such processes use electric appliances (eg, saws, polishers and drills), with the working edge of the tools often impregnated with diamond.

Traditionally Māori used stone tools to work the pounamu. Boulders or slabs were cut using pieces of quartz-rich sandstone, greywacke or schist as saws. Deep grooves were sawn on each side of the pounamu, which was then snapped along the furrows. Quartz sand was used as an abrasive to shape and smooth the stone – a time-consuming task. Holes were drilled using sand, water and a weighted stick with a quartz tip tied on at the end. Making one pounamu adze could take weeks or months.

The tremolite and actinolite minerals in nephrite pounamu sometimes have very small fibres or can be mixed with a variety of asbestos. Inhaling their fine powder can cause lung disease, so pounamu carvers are advised to wear masks while working.

Classroom resources

Classroom activities: <https://docs.google.com/document/d/16jeq5vthEka8G0Sa180op9-soM9Gqmi6rbFmG8WH-SA/edit?usp=sharing>

If you can visit the Canterbury Museum, their hands-on workshop, which includes the early Māori technology described here, is highly recommended.

TYPES OF POUNAMU

		
Kawakawa	Tangiwai	Kahurangi
		
Inanga	Flower jade	Pipiwharau
		
Raukaraka	Kokopu	Totoweka

Ngā Kupu

- hei tiki:** neck pendant depicting human image
- iwi:** extended kinship group or tribe with a common ancestor and distinct territory.
- mana:** prestige, authority, a supernatural force in a person, place or object.
- maunga:** mountains
- mauri:** life force
- ngā atua:** the gods
- pūrākau:** ancient story
- taonga:** prized treasure, may be an object, resource, phenomenon, idea or technique
- tapu:** sacred, prohibited, restricted, under atua protection
- tikanga:** correct procedure, custom, protocol
- wairua:** spirit, soul

Source: Te Aka Māori Dictionary

This article & the classroom activities benefitted from critique by Ange Fox (West Coast teacher), Ross Stephen (ESS teacher), Simon Cox (GNS scientist), Te Hunanga Ngapo (Waikato) – my thanks to you all.