

# JOURNEY OF A PEBBLE



When you're going on a long hīkoi | walk down a river, make stops along the way to notice the size and colour of the loose rocks.

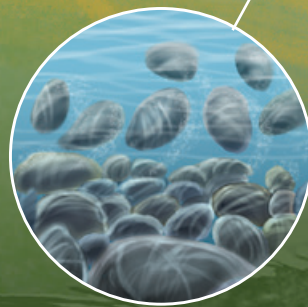
Pebbles don't start off as pebbles. They are formed over a long, long time (sometimes thousands of years) through earth processes called ngawhere | weathering and ngāhorohoro | erosion.

Up in the maunga | mountains, rainwater, and melted ice seeped into the bedrock (the solid base rock). The water freezes and expands (gets bigger). The pressure cracks the bedrock. Big chunks get loose and break off, making **toka | boulders**.

Mountains are steep, and slope downwards toward river valleys. Many boulders in the mountains tumble down into rivers via a landslide, which can be caused by earthquakes, lots of rain, or just gravity!

Being in an awa | river is not like being in a swimming pool. The water has energy due to its current (movement). The current is usually strongest where the river starts. Storms add lots more water and can make the current so powerful and fast moving that it can move boulders and break fragments off them! These different bits of rock (little by little) start to tumble downstream along the riverbed during floods.

**FACT:** Being in water softens rock.



The **tokaiti | cobbles** are made smaller and smaller over time as the water flows over them and moves them. The rocks scrape into each other, rub up against each other, and collide! Eventually, they are worked down to being the size of **tokariki | pebbles**.

Pebbles have a hard life - the constant tumbling and rolling of rocks along the riverbed is like being in a washing machine! All this tumbling helps to round pebbles. The moving water and sand also help to slowly shape and polish them.

Some pebbles will break down further (very, very slowly) until they become **onepū | sand**, then **parahua | silt**, then **uku | clay**.

Some pebbles get washed up onto the banks of the river. Some get washed down into a lake and get moved onto their shores, where they build up. Some get washed out to sea and are brought back to the beach by the waves.

Not all pebbles on a beach will have come from a river though. The energy of the waves breaks rock off from cliffs for instance. The salt water washing over the loose rock weathers and erodes it over time, just like the fresh water.

**FACT:** Beaches with pebbles are often called "shingle beaches".

RIVER MOUTH