

## How long is a coastline?

### Investigation Brief

The perimeter of an island is called its coastline. How exact can you get in measuring the perimeter or coastline of the 3 main islands of Aotearoa/New Zealand? What sort of impact does your measuring device have on the answer you find?

Investigate the estimated distances of the coastlines of Te Wai Pounamu/South Island, Te Ika a Maui/North Island and Rakiura/Stewart Island.



How accurate do the estimates get and how accurate can you be?

Devise a method for measuring one part of a coastline near you. If possible try to visit the place and think about how you could accurately measure the distance.

### Resources

- Access to Google maps and Google Earth
- Maps of Aotearoa/New Zealand
- Measuring tools such as rulers, metre sticks



### Prompts and Suggestions

Try working with the same piece of coastline on Google maps at different levels of magnification.

How would each of these methods impact on the perimeter measurement for a coastline? a) navigating a boat along the shore, b) walking the shoreline, or c) using a giant ball of string to move along the cliffs and rocks that shape the coastline.

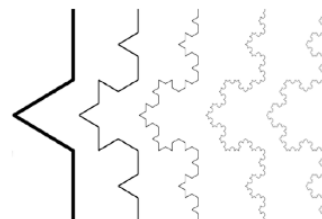
You may like to try creating a model of an island with an irregular coastline (perimeter). Photograph it from 2m above, 1m, 10 cm. Measure the coastline of your island using 3 different rulers, a meter stick, a 30cm ruler, and a cloth measuring tape. Does your perimeter

What does the term *fractal* mean?

Is a coastline infinite?

### Links

You can explore a fractal using an online tool at <http://illuminations.nctm.org/Activity.aspx?id=3513>



As you add greater detail you can see the increasing length of the perimeter in the table to the right. Is this representative of looking at a coastline? Why or why not?