## Where on Earth?

You need * access to the Internet * a globe or an atlas

TECHNOLOGY
Early seafarers like Kupe found their way across oceans using stars, currents, fish and bird activity, and cloud masses to guide them. Later explorers used maps and compasses. Technological advances, particularly GPS, have greatly increased the accuracy of navigational devices and systems.

## Activity

Milly's brother sends her a postcard with six numbers on it:


Milly's mum says the numbers are co-ordinates: the first three numbers give the latitude of a point and the second three numbers give the longitude.

A latitude of -34 is the same as 34 degrees south.

Latitude describes how far north or south of the Equator a point is.
Longitude describes how far east or west of the Prime Meridian (a line that passes through Greenwich, England) a point is.

Latitude and longitude are measured in degrees. Degrees can be divided into minutes and seconds. There are 60 minutes in a degree and 60 seconds in a minute.
(1.) a. Look at the lines of latitude and longitude on a globe or in an atlas.

Try to locate latitude -34 , longitude 172 .
b. Milly works out that her brother is somewhere in the North Island, but the latitude and longitude lines on her globe don't give enough information.
i. Do an Internet search for "latitude and longitude of a point".
ii. Enter the co-ordinates from the postcard into the online latitude and longitude table.
iii. Where is Milly's brother?

2. Use the latitude and longitude site to find out what is located at the places described by these co-ordinates:

3. a. On the latitude and longitude site, enter your home address (or an address you know) to find its co-ordinates in degrees, minutes, and seconds.

b. i. When you enter the address you have chosen, the co-ordinates appear in a table below the map. Copy the degrees, minutes, and seconds for your address into the "show point" table.

|  | Degrees | Minutes |
| :--- | :---: | :---: | Seconds


ii. On this second table, increase the latitude by 1 second. (If necessary, use the zoom function to see both markers clearly on the map.)
iii. Use the scale on the map to estimate the distance between the two points.
iv. Increase the latitude by 1 minute.
v. What happens to the scale on the map when you zoom out? Why do you think this happens?
vi. Estimate the distance between the second and third markers.

vii. Increase the latitude of the co-ordinates by 1 degree and estimate the distance between the third and fourth markers.


My address has a latitude of -41 degrees.
If I add 1, do I get -40 or -42 ?
4. Without using the Internet, use what you have learned about co-ordinates to decide which set of co-ordinates matches which place on the map:


