Method Summary:

Student 6: High Not Achieved
NZQA Intended for teacher use only

Too much carbon dioxide!

Purpose:

A/ To see how altering the amount of CO_2 dissolved in sea water alters the pH of the sea water solution.

B/ To see how this acidified sea water dissolves calcium carbonate rich mollusc shells using cockle shells (Austrovenus stutchburyi) from the Aromoana Estuary.

Method:

(Students followed a valid method that allowed for the production of valid data.)

Results:

Sea water plus Dry ice pH

250 mLs sea water + 0g Dry ice	8.06 +- 0.02
250 mLs sea water + 1g Dry ice	8.03 +- 0.02
250 mLs sea water + 2g Dry ice	7.99 +- 0.02
250 mLs sea water + 3g Dry ice	7.94 +- 0.02
250 mLs sea water + 4g Dry ice	7.79 +- 0.02

Average loss of mass in cockle shells in different solutions pH solutions

Sea water pH mass loss as a percentage (7 days)

8.06	1.01%
8.03	1.92%
7.99	2.13%
7.94	2.35%
7.79	2.51%

Conclusion:

The results show that the more carbon dioxide that ends up dissolved in sea water the lower the pH. This lower pH is the main cause of ocean acidification. Sea water is slightly basic and excess carbon dioxide dissolved in the sea water makes it more acidic. (1)

Reasons why these results are reliable and valid.

My results are reliable and valid because I made sure the fair test was repeatable. Weighing the dry ice was a problem to start with as it was hard to get the required amount.

The cockles were washed, cleaned and dried at 70^0C for 20 minutes and allowed to come to room temperature. The mass was accurately measured and shells placed into each flask at the measured pH. The shells were left in the solution for 2 days. (2)