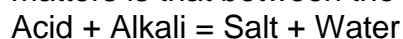# Reaction of Acid and Alkali

What science says

The scientific model says that the pH of the mixture is logarithmically related to the concentration of hydrogen ions in the solution

$pH = -\log[H+]$

and that for strong (not concentrated) acids and alkalis the only reaction that matters is that between the acid and the alkali

Acid + Alkali = Salt + Water

However, for weak acids and alkalis the picture is much more complicated and one gets a quartic equation for [H+] which is best solved iteratively.

Capturing the data

How will you measure the pH?
How will you measure the volume of acid/alkali added?
What assumptions are you making in taking these measurements?
What shape do you expect curves of pH against volume of acid added and [H+] against volume of acid added to have for combinations of strong and weak acids and bases?

Modelling the data

What variable will you use for your model?
What variable(s) will you empirically adjust?
Why might the model not fit your data
You may find it helpful to explore the simulation I have produced for this reaction.

Extensions

What might you (or children) expect to affect the reaction that does not appear in the model? (Or not to affect the reaction which does appear in the model)
How could you test whether this/these variables really do have no effect?
Use the model to make a prediction - then test this empirically.