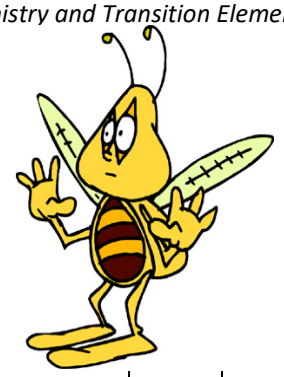
Acids, bases and buffers



The key areas of study in this topic are:

- Brønsted–Lowry acids and bases
- pH and [$H^+_{(aq)}$]
- Buffers: action, uses and calculations

By the end of this topic I should be able to:	Start	End
Define a Brønsted–Lowry acid as a species that donates a proton and a Brønsted–Lowry base as a species that accepts a proton		
Describe and use the term conjugate acid–base pairs		
Illustrate the role of H^+ ions in the reactions of acids with metals and bases (including carbonates, metal oxides and alkalis), using ionic equations		
Explain that the acid dissociation constant, Ka, shows the extent of acid dissociation		
Understand the relationship between Ka and pKa		
Define and use the expression for pH: $pH = -\log[H^+]$ and $[H^+] = 10^{-pH}$		
State and use the expression for the *ionic product of water*, *K*w		
Calculate pH, or related quantities, for: • strong monobasic acids • strong bases, using Kw		
Calculate pH, Ka or related quantities, for a weak monobasic acid		
Understand the limitations of using approximations to Ka related calculations for 'stronger' weak acids		
Describe a buffer solution as a system that minimises pH changes on addition of small amounts of an acid or a base		
Describe the formation of a buffer solution from: • a weak acid and a salt of the weak acid e.g.CH_3COOH/CH_3COONa • excess of a weak acid and a strong alkali e.g. excess $CH_3COOH/NaOH$		
Explain the role of the conjugate acid–base pair in an acid buffer solution, e.g. CH_3COOH / CH_3COO^-, in the control of pH		
Calculate the pH of a buffer solution (and related quantities)		
Explain the control of blood pH by the H_2CO_3/HCO_3^- buffer system		
For pH titration curves for combinations of strong and weak acids with strong and weak bases • sketch and interpretation of their shapes • explain the choice of suitable indicators, given the pH range of the indicator • explain indicator colour changes in terms of equilibrium shift between the HA and A^- forms of the indicator		
Understand the techniques and procedures used when measuring pH with a pH meter.		

In all topic areas you should be able to demonstrate and apply your knowledge and understanding.