AS 91166
Demonstrate understanding of chemical reactivity
Level 2 4 Credits

This achievement standard involves demonstrating understanding of chemical reactivity.

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of chemical reactivity.	Demonstrate in-depth understanding of chemical reactivity.	Demonstrate comprehensive understanding of chemical reactivity.

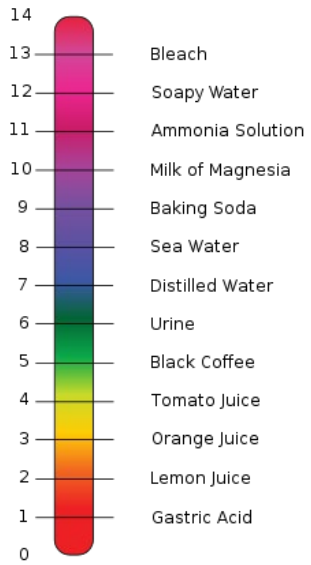
Chemical reactivity is limited to rates of reaction and equilibrium principles.

Rates of reaction:

- ❑ factors affecting rates of reaction – restricted to changes in
  - concentration
  - temperature
  - surface area
  - presence of a catalyst
- ❑ use of collision theory to explain the factors (includes activation energy)

Equilibrium principles:

- ❑ the dynamic nature of equilibrium
- ❑ the effect of changes on equilibrium systems
  - temperature
  - concentration
  - pressure
  - addition of a catalyst
- ❑ the significance of the equilibrium constant (*Kc*) for homogeneous systems
  - this may involve calculations
- ❑ the nature of acids and bases in terms of proton transfer
  - Brønsted-Lowry definitions / theory
  - acid-base conjugate pairs
- ❑ properties of aqueous solutions of strong and weak acids and bases including ionic species. The properties are restricted to
  - electrical conductivity
  - rate of reaction
  - pH
- ❑ calculations involving K_w and pH (restricted to strong acids and bases).
  - pH = -log $[H_3O^+]$
  - $[H_3O^+] = 10^{-pH}$
  - $K_w = [H_3O^+][OH^-] = 1x10^{-14}$ (at 25°C)



The Resource booklet provided will include the following:

$K_W = [H_3O^+][OH^-] = 1 \times 10^{-14}$ at 25°C pH = -log $[H_3O^+]$ $[H_3O^+] = 10^{-pH}$