| Subject | Year | Term |
|---|---|---|
| Chemistry | 12 | 2 |

## Topic

2.1.5 Redox and 3.1.2 Group 2

## Content (Intent)

**Prior Learning (Topic) KS3 Y8** 8C2 chemical reactions and the Earth **KS4 Y11** C4 Chemical changes K**S5 Y12** 2.1.4 Acids**,** 2.2.1 Electron structure

**Oxidation number**

**(a)** rules for assigning and calculating oxidation number for atoms in elements, compounds and ions
**(b)** writing formulae using oxidation numbers communication.
**(c)** use of a Roman numeral to indicate the magnitude of the oxidation number when an element may have

**Redox reactions**

**(d)** oxidation and reduction in terms of:
(i) electron transfer
(ii) changes in oxidation number
**(e)** redox reactions of metals with acids to form salts, including full equations **(see also 2.1.4 c)**
**(f)** interpretation of redox equations in (e), and unfamiliar redox reactions, to make predictions in terms of oxidation numbers and electron loss/gain.

**Redox reactions and reactivity of Group 2 metals**

**(a)** the outer shell $s^2$ electron configuration and the loss of these electrons in redox reactions to form 2+ ions
**(b)** the relative reactivities of the Group 2 elements Mg → Ba shown by their redox reactions with:
(i) oxygen
(ii) water
(iii) dilute acids
**(c)** the trend in reactivity in terms of the first and second ionisation energies of Group 2 elements down the group **(see also 3.1.1 c)**

**Reactions of Group 2 compounds**

**(d)** the action of water on Group 2 oxides and the approximate pH of any resulting solutions, including the trend of increasing alkalinity
**(e)** uses of some Group 2 compounds as bases, including equations, for example (but not limited to):
(i) $Ca(OH)_2$ in agriculture to neutralise acid soils
(ii) $Mg(OH)_2$ and $CaCO_3$ as 'antacids' in treating indigestion

**Future Learning (Topic) Y13** 5.2.3 Redox and electrode potentials 5.3.1 Transition elements

| How will knowledge and skills be taught? (Implementation) | How will your understanding be assessed & recorded (Impact) |
|---|---|
| Practical work:<br>Reactions of magnesium vs calcium with water, oxygen and dilute acids | - 1 x standard homework (Level given. Written feedback. Response expected.) |

| | |
|---|---|
| Written<br>Writing formula using oxidation numbers<br>Explanation for reactivity down group 2<br>Interpretation of redox equations | -1 x end of topic test (Level given. Verbal feedback to class and individuals.) |

## How can parents help at home?

Look at the topic specific resources on the VLE
Use appropriate websites: MachemGuy, Allery Chemistry, Chemistry World – by Royal Society of Chemistry, ChemGuide.
Take an interest! Ask your children what they have learnt and be curious about their learning.

## Helpful further reading/discussion

| **Reading** | **Vocabulary Lists** | **Careers Links** |
|---|---|---|
| Textbook pages<br>Redox – 44-52<br>Group 2 – 108-111<br>The Science of Everyday Life by Marty Jopson<br>Why Chemical Reactions Happen by Keeler and Wothers | Oxidation<br>Reduction<br>Electron transfer<br>Oxidation state/number<br>Alkalinity | Analytical chemist<br>Chemical engineer<br>Clinical biochemist<br>Forensic scientist<br>Pharmacologist<br>Process chemist<br>Quality control analyst<br>Research scientist<br>Science writer<br>Site chemist<br>Teacher or lecturer<br>Degrees;<br>Chemistry<br>Biochemistry<br>Biomedical science<br>Biological sciences<br>Medicine<br>Research chemist<br>Veterinary medicine |