

## AS91167 Demonstrate understanding of oxidation-reduction Level 2, 3 Credits (Internal)

This achievement standard involves demonstrating understanding of oxidation-reduction.

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of oxidation-reduction.	Demonstrate in-depth understanding of oxidation-reduction.	Demonstrate comprehensive understanding of oxidation-reduction.

*Demonstrate understanding involves describing, identifying, naming, giving an account of oxidation-reduction and describing oxidation-reduction reactions. This requires the use of chemistry vocabulary, symbols and conventions.*

*Demonstrate in-depth understanding involves making and explaining links between oxidation-reduction reactions, observations and equations. This requires explanations that use chemistry vocabulary, symbols and conventions.*

*Demonstrate comprehensive understanding involves justifying, evaluating, comparing and contrasting, or analysing links between oxidation-reduction reactions, observations and equations. This requires the consistent use of chemistry vocabulary, symbols and conventions.*

- Knowledge of the appearance of redox reactants and their products (observations) is required:

Oxidants including, but not limited to:

O <sub>2</sub>	I <sub>2</sub>	Br <sub>2</sub>	Cl <sub>2</sub>	OCI <sup>-</sup>	H <sup>+</sup>	Fe <sup>3+</sup>	Cu <sup>2+</sup>	H <sub>2</sub> O <sub>2</sub>	MnO <sub>4</sub> <sup>-</sup> / H <sup>+</sup>	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> / H <sup>+</sup>	Conc. HNO <sub>3</sub>	IO <sub>3</sub> <sup>-</sup>
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Reductants including but not limited to:

metals	C	H <sub>2</sub>	Fe <sup>2+</sup>	Br <sup>-</sup>	I <sup>-</sup>	H <sub>2</sub> S	SO <sub>2</sub>	SO <sub>3</sub> <sup>2-</sup>	HSO <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O <sub>2</sub>
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- Redox in terms of
- Gain/loss of oxygen/hydrogen
  - Loss / gain of electrons – electron transfer
    - LEO the lion says GER or OIL RIG
  - Increase / decrease in oxidation numbers



- Oxidation numbers
- Rules used to determine oxidation numbers
  - Apply rules to determine oxidation numbers
  - Use oxidation numbers to determine if a species has been oxidised / reduced / neither
  - Identifying disproportionation

- Write balanced oxidation-reduction half equations
- Balance “atoms”, “O’s”, “H’s” and charge
  - Combine balanced half equations to give overall balanced oxidation-reduction equations

- Identify oxidants and/or reductants
- Oxidant / oxidising agents; gain electron(s) / oxidation number decrease
    - Is reduced in the process
  - Reductant / reducing agents; lose electron(s) / oxidation number increase
    - Is oxidised in the process