

## Access to Higher Education Unit

This unit forms part of an Access to HE Diploma. If delivering the graded version of this unit, please refer to the Provider Handbook for details on grading descriptors and the application of these across units within your programme.

**Unit Title:** The Transition Elements

**Graded Unit Reference Number:** GA33CHE15

**Ungraded Unit Reference Number:** UA33CHE15

**Module:** Chemistry

**Level:** Three (3)

**Credit Value:** Three (3)

**Minimum Guided Learning Hours:** 30

**Units barred for selection against this unit:**

- Characteristics of the Periodic Table (GA36CHE18 / UA36CHE18)

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Recognise the properties and trends in transition elements	1.1 Write the configuration of a transition element and its ion limited to the series scandium to zinc
	1.2 Describe the physical and chemical properties: variable oxidation state, catalytic activity, coloured ions and complex formation
	1.3 Using specific examples, explain how transition metals or their complexes are able to act as homogeneous and heterogeneous catalysts
	1.4 Explain why transition metal complexes are coloured
2. Understand the common reactions of the ions $\text{Cu}^{2+}$ , $\text{Co}^{2+}$ , $\text{Cr}^{3+}$ and $\text{Fe}^{3+}$	2.1 Investigate how each ion ( $\text{Cu}^{2+}$ , $\text{Co}^{2+}$ , $\text{Cr}^{3+}$ and $\text{Fe}^{3+}$ ) reacts with aqueous ammonia, include any observations and the relevant equations

	2.2 Investigate how each ion ( $\text{Cu}^{2+}$ , $\text{Co}^{2+}$ , $\text{Cr}^{3+}$ and $\text{Fe}^{3+}$ ) reacts with aqueous sodium hydroxide, include any observations and the relevant equations
3. Know the concept of oxidation and reduction in terms of electron transfer	3.1 Define oxidation and reduction in terms of electron transfer
	3.2 Construct redox half-equations for a variety of species, including oxygen-containing species which involve acidification
	3.3 Apply half-equations to balance equations of redox reactions, including oxygen-containing species which involve acidification