

Unit Overview: Module 5 – Physical Chemistry and Transition Elements

Half- Term:	AUT 1	AUT 2	SPR 1	SPR 2	SUM 1	SUM 2	No of Lessons:	72
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Key Focus for Unit:*What is the key knowledge being delivered?**What is the intent of this unit?*

The content within this module assumes knowledge and understanding of the chemical concepts developed in Module 2: Foundations in chemistry and Module 3: Periodic table and energy. This module extends the study of energy, reaction rates and equilibria, and the periodic table.

The areas of study include both physical and inorganic chemistry:

- Rate equations, orders of reaction, the rate-determining step
- Equilibrium constants, K_c and K_p
- Acid-base equilibria including pH, K_a and buffer solutions
- Lattice enthalpy and Born-Haber cycles
- Entropy and free energy
- Electrochemical cells
- Redox chemistry
- Transition elements

This module has many synoptic links with some of the subject content previously studied in AS (Year 12 - Module 2 and 3). The knowledge of Module 2 and Module 3 will be assumed and examination questions are set that link the content with this module and other areas of chemistry. This is something that is shared with the students and empowers them to continue with revision of topics they learnt in AS in their own independent study time.

Key Knowledge and Big Ideas:*What **Powerful Knowledge** and **Big Ideas** are explored in this Unit?**How have these progressed from previous learning? What **gaps in knowledge** have you identified from **baselining** and how are they being closed?*

The Big Idea that this topic links to is *Chemical Reactions* – the importance of understanding how chemical reactions are governed by the physical laws of nature is paramount to understanding how this module links to the wider world and can be contextualised.

Student baselines are assessed through retrieval practice in starter questions.

Lessons regularly highlight where synoptic links can be found within Module 5 that point to Module 2 and Module 3.

Unit Assessment:

How will this unit be assessed?

What is the frequency of assessments – baselines etc?

Formative assessment:

- 6 mark extended writing tasks
- Assesses powerful knowledge and literacy
- Feedback and response time built into lesson
- Practical Assessment Group (PAGs) activities regularly embedded throughout the scheme of work

Summative assessment:

- 45minutes assessment
- Assessed in practice papers
- Assesses powerful knowledge through past exam questions
- Feedback and response time built into lesson

Homework KS3/4:

- Weekly Past Paper Questions
- Analysis of experimental data from PAGs
- Assesses powerful knowledge and literacy

<u>Key Skills Explored</u>	<u>Vocabulary Selected for DVI</u>	<u>Links to Previous Unit</u>
<ul style="list-style-type: none">• Apply investigative approaches and methods to practical work• Safely and correctly use a range of practical equipment and materials• Visualise physical and chemical processes<ul style="list-style-type: none">• Manipulation of mathematical equations• Relating observable phenomena to underlying concepts• Developing chemical common sense	<ul style="list-style-type: none">• Quantitative• Qualitative• Percentage• Economy• Titration• Oxidation• Substance• Redox	<ul style="list-style-type: none">• GCSE Chemistry• Module 1 – PAGs• Module 2 – Foundations in Chemistry• Module 3 – Periodic Table and Energy
<u>Links to Careers/Employability</u>	<u>How does this unit prepare students for the next unit?</u>	
<ul style="list-style-type: none">• Chemist• Doctor/ Dentist• Lab Researcher<ul style="list-style-type: none">• Pharmacist• Oil and Gas	This module provides many opportunities for students to develop mathematical skills, including the use of logarithms and exponents, when studying the content of this section and when carrying out quantitative practical work. For students who apply to study university courses such as Chemistry, Biochemistry, Natural Sciences, Engineering, Physics, Mathematics will be at an advantage having succeeded in this module within A-Level Chemistry	

<ul style="list-style-type: none">• Chemical Engineer<ul style="list-style-type: none">• Analytical skills• Highly desirable course for employers in the financial services	
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KO

Black (all)

Higher (Dark green)

Triple (Maroon / burgundy)