

IB CHEMISTRY YEAR 2 - Unit 3

Teacher(s)	IB Chemistry PLC	Subject Group and Course	Group 4 - Chemistry		
Course Part and Topic	2.2 - Electron Configuration 3.2 - Periodic Trends	SL or HL / Year 1 or 2	SL Year 2	Dates	4 weeks (Nov-Dec)
Unit Description and Texts		DP Assessment(s) for Unit			
<ul style="list-style-type: none"> Murphy et al. <i>Oxford IB Diploma Programme: Chemistry Course Companion</i>, 2014 edition. Brown and Ford. <i>Pearson Baccalaureate Standard Level Chemistry</i>, 2nd edition. 		<ul style="list-style-type: none"> Practice Papers 1 and 2 (Unit Exam) 			

INQUIRY: establishing the purpose of the unit

Transfer Goals
<p>List here one to three big, overarching, long-term goals for this unit. Transfer goals are the major goals that ask students to “transfer” or apply their knowledge, skills, and concepts at the end of the unit under new/different circumstances, and on their own without scaffolding from the teacher.</p>
<p>Phenomenon: The line emission spectrum of hydrogen provides evidence for the existence of electrons in discrete energy levels, which converge at higher energies.</p> <p>Statement of Inquiry: The arrangement of elements in the periodic table helps to predict their electron configuration and physical and chemical properties.</p> <ol style="list-style-type: none"> Students can explain the difference between continuous spectra and line spectra using features of the Bohr model. Students can deduce the full electron configuration and orbital diagram for any element or ion. Students can explain periodic trends of physical and chemical properties for the elements.

ACTION: teaching and learning through inquiry

Content / Skills / Concepts - Essential Understandings	Learning Process
<p><u>Students will UNDERSTAND the following CONTENT:</u></p> <ul style="list-style-type: none"> Emission spectra are produced when photons are emitted from atoms as excited electrons return to a lower energy level The line emission spectrum of hydrogen provides evidence for the existence of electrons in discrete energy levels, which converge at higher energies The main energy level or shell is given an integer number, n, and can hold a maximum number of electrons, $2n^2$ A more detailed model of the atom describes the division of the main energy level into s, p, d and f sub-levels of successively higher energies Sub-levels contain a fixed number of orbitals, regions of space where there is a high probability of finding an electron Each orbital has a defined energy state for a given electronic configuration and chemical environment and can hold two electrons of opposite spin Vertical and horizontal trends in the periodic table exist for atomic radius, ionic radius, ionization energy, electron affinity and electronegativity Trends in metallic and non-metallic behaviour are due to the trends above Oxides change from basic through amphoteric to acidic across a period <p><u>Students will DEVELOP the following SKILLS:</u></p> <ul style="list-style-type: none"> Describe the relationship between color, wavelength, frequency, and energy across the electromagnetic spectrum Distinguish between a continuous and a line spectrum Describe the emission (line) spectrum of the hydrogen atom, including the relationships between the lines and energy transitions to the first, second, and third energy levels Recognize the shape of s and p orbitals Apply the Aufbau principle, Hund's rule and the Pauli exclusion principle to write electron configurations (full, condensed, and orbital diagrams) for atoms and ions up to $Z = 36$ Explain the unexpected electron configurations of Cr and Cu Predict properties for any element based on general vertical and horizontal trends Discuss the discontinuities in the increase of ionization energy across a period Predict and explain the metallic and non-metallic behaviour of an element based on its position in the periodic table Discuss trends in reactions of alkali metals with water 	<p><i>Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.</i></p> <p>Learning experiences and strategies/planning for self-supporting learning:</p> <p><input checked="" type="checkbox"/> Lecture</p> <p><input type="checkbox"/> Socratic seminar</p> <p><input checked="" type="checkbox"/> Small group/pair work</p> <p><input checked="" type="checkbox"/> PowerPoint lecture/notes</p> <p><input checked="" type="checkbox"/> Individual presentations</p> <p><input checked="" type="checkbox"/> Group presentations</p> <p><input checked="" type="checkbox"/> Student lecture/leading</p> <p><input type="checkbox"/> Interdisciplinary learning</p> <p>Details:</p> <p><i>Students will learn through a combination of presentations, small group work, and practice problems.</i></p> <p><input checked="" type="checkbox"/> Other(s): <i>practice problems</i></p>

<ul style="list-style-type: none"> • Discuss trends in reactions of alkali metals with halogens • Discuss trends in reactions of halogens and halide ions 	<p>Formative assessment(s):</p> <p><i>Short closer quizzes for each lesson</i> <i>Daily formative checks</i></p> <p>Summative assessments:</p> <p><i>Exam consisting of Paper 1 and Paper 2 questions</i></p> <p>Differentiation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Affirm identity - build self-esteem <input checked="" type="checkbox"/> Value prior knowledge <input checked="" type="checkbox"/> Scaffold learning <input checked="" type="checkbox"/> Extend learning <p>Details:</p> <ul style="list-style-type: none"> • <i>SWD/504 – Accommodations Provided</i> • <i>ELL – Reading & Vocabulary Support</i> • <i>Intervention Support</i> • <i>Extensions – Enrichment Tasks and Project</i>
<p>Approaches to Learning (ATL)</p> <p><i>Check the boxes for any explicit approaches to learning connections made during the unit. For more information on ATL, please see the guide.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Thinking <input type="checkbox"/> Social <input checked="" type="checkbox"/> Communication <input checked="" type="checkbox"/> Self-management 	

☐ Research

Details:

Students will communicate their findings to their peers in the form of small-group presentations.

Students must use self-management skills to complete work in a timely and accurate manner.

Language and Learning <i>Check the boxes for any explicit language and learning connections made during the unit. For more information on the IB's approach to language and learning, please see the guide.</i>	TOK Connections <i>Check the boxes for any explicit TOK connections made during the unit</i>	CAS Connections <i>Check the boxes for any explicit CAS connections. If you check any of the boxes, provide a brief note in the "details" section explaining how students engaged in CAS for this unit.</i>
<div> <input checked="" type="checkbox"/> Activating background knowledge <input checked="" type="checkbox"/> Scaffolding for new learning <input checked="" type="checkbox"/> Acquisition of new learning through practice <input checked="" type="checkbox"/> Demonstrating proficiency </div> <p>Details:</p> <p><i>Content and vocabulary introduced in previous science courses will be used in this unit.</i></p> <p><i>Students will acquire new vocabulary.</i></p> <p><i>Students will continually demonstrate proficiency with chemistry vocabulary in class discussions and group work.</i></p>	<div> <input type="checkbox"/> Personal and shared knowledge <input checked="" type="checkbox"/> Ways of knowing <input type="checkbox"/> Areas of knowledge <input type="checkbox"/> The knowledge framework </div> <p>Details:</p> <p><i>TOK knowledge questions will be included as discussion options for each lesson.</i></p>	<div> <input type="checkbox"/> Creativity <input type="checkbox"/> Activity <input type="checkbox"/> Service </div> <p>Details:</p> <p>N/A</p>

Resources
<i>List and attach (if applicable) any resources used in this unit</i>
<ul style="list-style-type: none"> • Textbooks (Oxford and Pearson - see page 1) • Online notes and videos (Schoology)

REFLECTION: considering the planning, process, and impact of the inquiry

What worked well <i>List the portions of the unit (content, assessment, planning) that were successful</i>	What didn't work well <i>List the portions of the unit (content, assessment, planning) that were not as successful as hoped</i>	Notes / Changes / Suggestions <i>List any notes, suggestions, or considerations for the future teaching of this unit</i>
•	•	•