# Diploma Program Subject Outline (2025-2027)

## Chemistry HL

| Week | Week of… | Topic / Unit / Text | Content / Skill Development | Graded Assessments |
|---|---|---|---|---|
| **Year 1 Semester 1** | | | | |
| 1 | **August 18** | Course Introduction & Safety | • IB DP expectations.<br>• Lab safety routines. | |
| **2** | **August 25** | Structure 1.1—Introduction to the particulate nature of matter | • Elements and mixtures.<br>• Distinguish the different states of matter.<br>• Use state symbols in chemical reactions (s, l, g, aq).<br>• Convert between values in the Celsius and Kelvin scales. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 3 | **September 2** | Structure 1.4—Counting particles by mass: The mole | • Mole concept;<br>• molar mass;<br>• Avogadro constant;<br>• quantitative analysis;<br>• balancing equations; | |
| 4 | **September 8** | | | |
| **5** | **September 15** | Structure 1.5—Ideal gases | • Gas laws;<br>• molar volume;<br>• reacting volumes;<br>• experimental data interpretation;<br>• graphing pressure–volume relationships. | Summative assessment: Paper 1 and paper 2 |
| 6 | **September 22** | Reactivity 2.1—How much? The amount of chemical change | • Limiting reactants;<br>• percentage yield;<br>• atom economy; | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| **7** | **September 29** | **National Holiday** | | |
| **8** | **October 6** | Reactivity 2.1—How much? The amount of chemical change | • Limiting reactants;<br>• percentage yield;<br>• atom economy; | Summative assessment: Paper 1 and paper 2 |
| 9 | **October 13** | Structure 1.2—The nuclear atom | • Subatomic particles;<br>• isotopes;<br>• mass spectrometry<br>• peak interpretation;<br>• atomic models. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 10 | **October 20** | | | |
| **11** | **October 27** | Structure 1.3—Electron configurations | • Electron configuration;<br>• emission spectra;<br>• quantized energy levels;<br>• photon energy calculations. | Summative assessment: Paper 1 and paper 2 |
| **12** | **November 3** | | | |
| **13** | **November 10** | Structure 3.1—The periodic table: Classification of elements | • Periodic trends;<br>• effective nuclear charge;<br>• Shielding; trend interpretation using data tables. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 14 | **November 17** | | | |
| **15** | **November 24** | Week Without Wall | | |
| 16 | **December 1** | Structure 3.1—The periodic table: Classification of elements | • Period 3 element oxides;<br>• acidity/basicity;<br>• halogen and alkali metal reactivity;<br>• pattern explanation skills. | Summative assessment: Paper 1 and paper 2 |
| 17 | **December 8** | Structure 2. Models of bonding and structure | • Ionic, covalent,<br>• metallic bonding;<br>• electron distribution models;<br>• lattice structure reasoning. | |
| 18 | **December 15** | | | |
| **19** | **December 22** | **Christmas & New Year** | | |

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|------|----------|---------------------|----------------------------|---------------------|
| 20 | December 30 | Christmas & N | | |
| 21 | January 5 | Structure 2. Models of bonding and structure | • VSEPR molecular geometry;<br>• polarity;<br>• intermolecular forces;<br>• predicting physical properties. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 22 | January 12 | | | |
| 23 | January 19 | | | |
| **Year 1 Semester 2** | | | | |
| 1 | January 26 | Structure 2. Models of bonding and structure | • Network covalent structures;<br>• metallic bonding at HL depth;<br>• delocalization;<br>• conductivity reasoning | Summative assessment:<br>Paper 1 and paper 2 |
| 2 | February 2 | | | |
| 3 | February 9 | IA Introduction | • RQ formulation;<br>• variable identification;<br>• method design;<br>• reliability & validity considerations. | Summative assessment:<br>Paper 1 and paper 2 |
| 4 | February 16 | **Chinese New Year** | | |
| 5 | February 23 | **Chinese New Year** | | |
| 6 | March 2 | Review | • Review of topics 1-5 | |
| 7 | March 9 | Semester Exam | | Summative assessment:<br>Paper 1 and paper 2 |
| 8 | March 16 | Reactivity 1.What drives chemical reactions? | • Endo/exothermic processes;<br>• calorimetry;<br>• data processing;<br>• heat capacity calculations. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 9 | March 23 | Reactivity 1.What drives chemical reactions? | • Born–Haber cycles;<br>• lattice enthalpy;<br>• electron affinity;<br>• comparing ionic models | First IA practice |
| 10 | March 30 | | | |
| 11 | April 6 | **Easter Holiday** | | |
| 12 | April 13 | Reactivity 1.What drives chemical reactions? | • Entropy, spontaneity, Gibbs free energy;<br>• interpreting feasibility from $\Delta G$ values | Summative assessment:<br>Paper 1 and paper 2 |
| 13 | April 20 | | | |
| 14 | April 27 | Reactivity 2.2—How fast? The rate of chemical change | • Rate laws;<br>• reaction mechanisms;<br>• determining reaction orders from data. | Second IA practice<br>Summative assessment:<br>Paper 1 and paper 2 |
| 15 | May 4 | | | |
| 16 | May 11 | | | |
| 17 | May 18 | **Review Week** | • <mark>Final Exam Review</mark> | |
| 18 | May 25 | **Final Exam Week** | | |
| 19 | June 1 | IA Work | • Data collection;<br>• quantitative processing;<br>• error propagation;<br>• evaluation. | |
| 20 | June 8 | | | |
| 21 | June 15 | **Collaborative Science Project** | | |
| **Year 2 Semester 1** | | | | |
| 1 | August | Reactivity 2.3—How far? The extent of chemical change | • Dynamic equilibrium model; Le Châtelier's principle; qualitative prediction. | Summative assessment:<br>Paper 1 and paper 2 |
| 2 | August | | | |
| 3 | September | Reactivity 3.1—Proton transfer reactions | • pH calculations;<br>• strong vs weak acids;<br>• logarithmic skills;<br>• pH meter use. | Summary note<br>Inthinking homework<br>Kognity Reading & Classwork |
| 4 | September | | | |
| 5 | September | Reactivity 3.1—Proton transfer reactions | • Titration technique;<br>• indicators;<br>• volumetric analysis; processing titration curves | Third IA practice |
| 6 | September | | | |
| 7 | September | **National Holiday** | | |
| 8 | October | Reactivity 3.1—Proton transfer reactions | • Buffer theory;<br>• buffer capacity;<br>• interpreting titration curves;<br>• acid–base equilibria. | Summative assessment:<br>Paper 1 and paper 2 |
| 9 | October | | | |

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|---|---|---|---|---|
| 10 | **October** | Reactivity 3.2—Electron transfer reactions | • Oxidation states;<br>• balancing redox equations;<br>• electron transfer models. | Summative assessment: Paper 1 and paper 2 |
| 11 | **October** | | | |
| 12 | **November** | | | |
| 13 | **November** | | | |
| 14 | **November** | IA Drafting | • Writing analysis;<br>• improving methodology;<br>• graphing standards. | IA draft |
| 15 | **November** | Structure 3.2—Functional groups: Classification of organic compounds | • Functional groups;<br>• homologous series;<br>• isomerism;<br>• structural representation skills. | Summative assessment: Paper 1 and paper 2 |
| 16 | **December** | | | |
| 17 | **December** | | | |
| 18 | **December** | | | |
| **19** | **December** | **Christmas & New Year** | | |
| **20** | **January** | **Christmas & New Year** | | |
| 21 | **January** | IA Finalization | | IA Final |
| **Year 2 Semester 2** | | | | |
| 1 | **January** | Reactivity 3.3—Electron sharing reactions | • Reaction pathways;<br>• synthesis planning;<br>• identifying reagents & conditions | Summative assessment: Paper 1 and paper 2 |
| 2 | **January** | Reactivity 3.4—Electron-pair sharing reactions | • Stereochemistry;<br>• mechanisms (SN1/SN2/E1/E2);<br>• optical isomerism. | Summative assessment: Paper 1 and paper 2 |
| **3** | **January** | **Chinese New Year** | | |
| **4** | **February** | **Chinese New Year** | | |
| **5** | **February** | **DP Mock Examination Review** | | |
| 6 | **February** | **DP Mock Examination** | | |
| 7 | **February** | **Review** | | |
| **8** | **March** | **Review** | | |
| **9** | **March** | **Review** | | |
| **10** | **March** | **Review** | | |
| **11** | **March** | **Review** | | |
| **12** | **March** | **Review** | | |
| **13** | **March** | **Review** | | |
| **14** | **April** | **Easter Holiday** | | |
| **15** | **April** | **Review** | | |
| **16** | **April - May** | **IB DP May Examination** | | |