CHEMISTRY CURRICULUM MAP [OCR-A H432]

JMF6 ABINGDON

Specific careers that utilise skills from **Chemistry** might include:

- Medicinal chemist, chemical engineer, chemical analyst
- Medicine, pharmacy, nursing and Dentistry
- Teaching

Opportunities for further study:
Chemistry can lead to both undergraduate and apprenticeship opportunities. Some courses include medicine, veterinary science, biomedical research, natural sciences, environmental science and many more.

Students will be assessed on most of the course with papers 1 and 2.

Mock exams

Terms 1 and 2: Rates of reaction and equilibrium and organic chemistry

Teacher 1:
With teacher 1, students will add to their knowledge of rates of reaction and equilibrium, including acids and bases, and buffers.

Teacher 2:
With teacher 2, students will learn about aromatic compounds and their reactions, carbonyls and carboxylic acids, amines, amino acids, and polymers

Terms 3 and 4: Redox, transition elements, and synthesis and analysis

Teacher 1:
Students will learn about redox reactions, electrode potentials, transition elements, and complexes.

Teacher 2:
Students will learn about organic synthesis and analytical techniques, including NMR.

Paper 3: Unified chemistry

For this paper, students will need their knowledge of the entire course and be able to apply it to questions that will interweave inorganic and organic chemistry.

Term 5: Revision

With both teachers, students will revise and refine exam technique. They will spend time here focusing on the unified paper, they will also continue with reactive and general revision with a focus on exam questions.

Further study and career pathways

Over the summer, students will review their knowledge from year one of the course and ensuring this is embedded ahead of year 13.

Students will be assessed their year 1 knowledge with 2 AS papers: breadth and depth in chemistry.

Mock exams

Year 13

Terms 5 and 6: Reaction rates and equilibrium, and organic practical skills

Teacher 1:
With teacher 1, students will study reaction rates and equilibrium.

Teacher 2:
Students will focus on their organic chemistry practical skills with the synthesis, purification, and analysis of aspirin.

With both teachers, students will work on their weaknesses identified by their MOCK exam.

Paper 2: Synthesis and analytical techniques

For this paper, students will study:

- Core organic chemistry
- Organic synthesis
- Functional groups analysis
- Infra-red, mass spectrometry, and NMR analysis

Terms 3 and 4: Periodicity and energy, and core organic chemistry

Teacher 1:
With teacher 1, students will study the periodic table, its trends (ionisation, bonding, physical properties, reactivity) and specific groups, qualitative analysis, and enthalpy changes.

Teacher 2:
With teacher 2, students will study the nomenclature of organic compounds, isomerism, reaction mechanisms, specific reaction pathways, synthetic routes, and infra-red and mass spectrometry techniques.

KS5 chemical challenges:

- Y12 and 13: Olympiad
- Y12: C3L6

Year 12

Paper 1 : Periodic table, elements and physical chemistry

For this paper, students will study:

- Foundations in chemistry
- The periodic table
- Enthalpy changes
- Reaction rates and equilibrium

Terms 1 and 2: Foundations in chemistry

Teacher 1:
With teacher 1, students will study atoms, moles, formulae, and equations. They will have opportunities to practice many calculations and to be introduced to new practical skills.

Teacher 2:
With teacher 2, students will study more details about the atoms, bonding, and structure. More specifically, they will learn about the electron configuration, the different types of bonding, the shape of molecules, polarisation, and intermocular forces. They will also be introduced to oxidation numbers and redox reactions.

Non-Examined Assessment: Practical endorsement

Throughout the two-year course students will complete at least 12 practicals. These work to investigate the theory but also develop students' practical skills and techniques in chemistry.

KS5 extra-curricular opportunities:

- IRIS greener fragrances research project
- Mentoring of lower years

Year 13

Inorganic

Year 13 Terms 1 and 2: **Rates of reaction and equilibrium and organic chemistry**

Why this?

Both topics constitute the main part of the course and students carry on with what they started in year 12.

Why now?

- Students have learned the foundations in reaction rates, equilibrium, and organic chemistry, and they are now ready to deepen their knowledge.

Year 13 Terms 3 and 4: **Redox, transition elements, and synthesis and analysis**

Why this?

Inorganic chemistry builds on redox principles and introduces transition elements, which are central to understanding complex chemical behaviour and catalysis. The final unit in organic chemistry brings all the reaction pathways learned together, showing all the interconnectivity and various routes.

Why now?

- Students are now equipped with the foundational and intermediate knowledge needed to tackle more abstract and interconnected chemical concepts. This timing allows them to consolidate their understanding of redox and transition metals while synthesising their organic chemistry learning into a coherent whole.
- Bringing all their organic chemistry knowledge together can only occur at the end of the course.

Year 13 Terms 5 : **Revision**

Why this?

Having encountered the full course, students practise exam technique and revision for the final few weeks before exams.

Why now?

- All units have been covered: this part of the course will interleave knowledge and exam skills responsively to student need.

Year 12

Year 12 Terms 1 and 2: **Foundations in chemistry**

Why this?

This topic will introduce students to the fundamentals in chemistry which will be integral for the future topics covered.

Why now?

- It bridges the gap between GCSE taking content they are familiar with but extending to an A level standard.
- The knowledge learnt will be required to allow understanding of future topics.
- Students will begin to develop their practical skills in readiness for the practical assessment of the course.

Year 12 Terms 3 and 4: **Periodicity and energy, and core organic chemistry**

Why this?

Students need to understand the predictability of chemistry and the reasons behind it. They also need basic nomenclature and knowledge in organic chemistry.

Why now?

- Allows students to build a strong understanding of why chemical reactions occur.
- Basis organic chemistry is necessary to be able to understand further organic chemistry synthesis.

Year 12 Term 5 and 6: **Reaction rates and equilibrium, and organic practical skills**

Why this?

Rates of chemical reactions are very important to chemists, especially in industry.

Organic chemists synthesise molecules and therefore practical techniques for synthesis and analysis are indispensable.

Why now?

- Students need to have some basic understanding of why chemical reactions occur as well as which ones before they can learn about rates, equilibrium, and organic practical skills.