

Year 10 - Chemistry

Autumn term

In chemistry students will build on knowledge gained in year 9 of atomic structure and the periodic table. They will now begin to understand how atoms bond by sharing or transferring electrons and how the shapes of molecules and the arrangement of giant structures have great importance in determining the way they behave. This topic lays the foundations for understanding the concepts of electrolysis and reactivity later on in the course.

Spring term

Chemistry continues with chemical calculations, a topic that brings students back to their learning from KS3 regarding the use of chemical symbols when describing chemical reactions and now extends it using information from the periodic table to calculate reacting masses, empirical and molecular formulae and concentrations of solutions. Avogadro's constant and the mole are also met for the first time in this topic and students will practice applying this in context. The mole will evolve their understanding of balanced symbol equations and the law of conservation of mass. Chemistry then revisits reactivity from KS3 where students build on this knowledge and their knowledge of ions to examine electrolytic processes, which have many important everyday uses such as batteries to power electrical devices to electroplating, **and these uses will be explored in depth**. This topic will lead into next term's learning on extraction of metals.

In the topic of acids and alkalis, material from KS3 is revisited such as the use of indicators, the pH scale and simple neutralisation reactions, however, now the focus is on explaining differences in pH and the reactions between acids and different types of bases to make salts. Salts have tremendous commercial value through their use in the food and pharmaceutical industry as well as in agriculture. Practical work involves making samples of soluble and insoluble salts to model how salts are obtained and purified so they are ready for use.

Summer term

Leading on from the work on electrolysis last term, students will explore how we obtain and use metals, including evaluating the value of recycling metals. **The transition metals are explored as a separate group and their many uses both on their own and in alloys are learned**. Continuing with the theme of chemistry as used in industry, students will then learn about the importance of reversible reactions **and the factors that affect the direction in which they move**, including that of the Haber process in the production of ammonia which revolutionised how we mass produce food to feed our exponentially growing population.

Students will then return to chemical calculations and extend their knowledge by calculating theoretical and actual yields obtained in chemical reactions and understanding the term atom economy so that they understand the importance of chemical reactions as financially lucrative processes. They will also extend their understanding of neutralization reactions by carrying out titrations and using the results of these to calculate the concentrations and volumes of unknown solutions. Titrations are an important technique in the development of new pharmaceuticals as well as in medicine to find out unknown concentrations of chemicals in blood or urine.

Notes for 2021-22

Due to the disruption caused by the pandemic, the current Year 10 students started their GCSE course later in Year 9. As a result of this they did not cover the separation techniques topic or the history of the periodic table. These topics will be addressed early in Year 10 instead.