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**LANGDON PARK SIXTH FORM**

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| **Subject: Chemistry** | **Year: Y12** | **Topic: 1.1 Atomic Structures** |

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| ***What does the topic contain and why study the contents***?All materials (everything) around us are made up of their smallest parts which are known as atoms. All atoms contain 3 sub-atomic particles but in different numbers. It is the different number of these sub-atomic particles that make all atoms of elements and compounds to be different. We need to study the structure of atoms in detail to describe and explain the physical and chemical properties of the materials (chemicals). Over the centuries the ideas on the atomic structure has been changing from extensive research in the field of Physics and Chemistry which provides the basis of understanding of atomic properties.This topic will focus on the chemical properties of elements depend on their atomic structure and in particular on the arrangement of electrons around the nucleus; the arrangement of electrons in orbitals is linked to the way in which elements are organised in the Periodic Table; how chemists can measure the mass of atoms and molecules to a high degree of accuracy in a mass spectrometer and also the principles of operation of a modern mass spectrometer will be studied. |

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| **Key terms**Atomic structureSub-atomic particlesElectronsProtonsNeutronsElectronic structure | nucleusenergy levelsenergy sub-levelsMass and proton number A moleAvogadro’s constant | IsotopesRelative atomic massMass spectrometerIonization energiesPositive ions Molecular ions |  |

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| **Success criteria** | **Pre-reading** | **Application and Assessment (date)** | **Home learning**  | **Extension – Cultural Capital and Reading** |
| **3.1.1.1 Fundamental particles** * I can describe the structure of atoms in terms of protons, neutrons and electrons
* I can recall the relative mass and relative charge of protons, neutrons and electrons

**3.1.1.2 Mass number and isotopes** * I can define atoms and ions in terms of numbers of protons, neutrons and electrons, as well as atomic number and mass number (including isotopes)
* I can describe how a time of flight mass spectrometer works
* I can identify elements and calculate relative atomic mass from mass spectroscopy data
* I am able to find the relative formula mass of compounds from mass spectroscopy data.

**3.1.1.3 Electron configuration** * I can give the electron structure of atoms and ions up to *Z*=36 in terms of s, p and d sub-shells
* I can explain how data from ionisation energies provides evidence for electron structure.
 | Consult your issued Chemistry textbooks in the first instance, then look at other textbooks in the library for alternative diagrams, other examples or further explanations. For more specialised books, ask for advice or use the keyword system in the library.AQA Chemistry 2nd Edition – Oxford University press: HaloalkaneStudy the Chem Sheets information**Videos** **Websites**RSC: Chemists in a social & historical context: <http://www.rsc.org/learn-chemistry/resource/res00001332/the-atom-detectives?cmpid=CMP00002843> RI Christmas Lecture – section on atomic structure <http://www.rsc.org/learn-chemistry/resource/res00001119/ri-christmas-lectures-2012-atomic-structure><http://filestore.aqa.org.uk/resources/chemistry/AQA-7404-7405-TN-MASS-SPECTROMETRY.PDF><http://filestore.aqa.org.uk/resources/chemistry/AQA-7404-7405-SG-TOFMS.PDF><http://filestore.aqa.org.uk/resources/chemistry/AQA-7404-7405-SG-TOFMS-QA.PDF> | Practical:Fortnightly mini-mock  | Learn and describe step by step how FoT mass spectrometer worksMake notes on each topicComplete all set home work[www.seneca.co.uk](http://www.seneca.co.uk) |  |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment |