**YEAR 11 CHEMISTRY ATAR 2021**

**Extended Response Research Task:**

**Atomic Models & Nanomaterials**

**Task**

Your task is to research the areas discussed in the following section, in order to sit a validation as part of CAP 1. You should use a range of resources to research this material, and it is recommended that your produce notes or a report. This work will not be collected or marked, and you **may not** bring it into the assessment, it is as a study aide only. You will be expected to answer questions on the areas below; the questions will take a variety of formats, including extended response questions.

**Areas to research**

**Atomic Models** *(Program objectives 23 – 26)*

John Dalton, J.J. Thomson, Ernest Rutherford, Niels Bohr, James Chadwick and Erwin Schrödinger all contributed to our understanding of the atom. Explain the contribution to our current understanding of atomic theory and atomic models for each scientist listed above.

Your research should cover:

* The chronology of the discoveries in question – how do they fit together to form a timeline?
* Specific experiments done by the scientists.
* Discoveries that were made.
* Theories that were developed.
* Models or developments to models that were proposed.

**Nanomaterials** *(Program objectives 17 – 22)*

At the nanometre scale (10-9 m), the chemical and physical properties of materials and structures show drastic deviations from those of their atomic or bulk forms. Exploiting these new properties has sparked research in energy, electronics, and cosmetics.

Your research should cover:

* A description of nanomaterials, and how their properties can differ from bulk materials.
* Examples of nanomaterials of interest, with explanation of how their unique properties make them useful.
* Discussion of carbon nanotubes, nanomaterials in sunscreen, and nanomaterials as a method of drug delivery.
* Discussion of the advantages and disadvantages of the use of nanomaterials.

**Suggested Resources**

These resources are a suggested place to start – it is recommended that you use a range of appropriate resources to complete your research.

* Pearson Chapter 2.1: Atomic theory
* Lucarelli Chapter 2: Discovering the atom’s structure
* Pearson Chapter 1.2: Nanotechnology, Pearson Chapter 4.4: Metallic nanomaterials and Pearson Chapter 7.2: Carbon nanomaterials
* Lucarelli Chapter 8.10 – 8.14: Nanotechnology
* <http://thehistoryoftheatom.weebly.com/index.html>
* <https://www.dummies.com/education/science/nanotechnology/how-materials-change-in-nanoscale/>