

# Chemistry (OCR)



## HAZELEY 6TH FORM

CHARACTER, CONFIDENCE & CREATIVITY

Deadline: Friday 11th  
September

The Hazeley Academy



3. Begin your work on calculations. Everything saves once you submit an individual answer, so your progress will be saved if you leave and come back to it later.
4. When you have completed all the problems, it will automatically feedback to your chemistry teachers with no need to submit any information via email or hard copy.

**Task 2: Atomic Structure Essay (100 minutes)**

**25% of assessment/50 marks**

There are 50 marks for your essay.

25/50 for knowledge and understanding. You need to show accurate use of key dates and events etc.

15/50 for your overall evaluation and analysis of your research.

10/50 for quality of written communication. This includes use of references, paragraphing, use of correct scientific terminology throughout.

The accepted model of the atom has changed throughout history based on new evidence and understanding of the particles that make up an atom. There is currently an accepted model that fits all the observations and evidence we have so far that we assume is true until new evidence emerges that is incompatible with previous ideas.

Carry out some research into the history of the structure of the atom and write a short essay (maximum 500 words/1 page) about how the idea of the structure of the atom has changed over time. Your essay should be typed, 11-12 pt font, and single-spaced. Provide a list of references at the end of your essay detailing where you found the information and be sure to use citations within your essay. You may choose a reference and citation style. The reference page is additional to the word limit.

You can hand in a hard copy of your essay to your chemistry teacher in September, or send it via email to Mrs J Harrier-Wilson: [jharrier-wilson@thehazeleyacademy.com](mailto:jharrier-wilson@thehazeleyacademy.com).

Consider these points:

- How did John Dalton describe the atom?
- How were the electron, proton, and neutron discovered?
- What particle did JJ Thompson discover, and how did his work change the view of atomic structure?
- Who developed the 'nuclear' model of the atom?
- Niels Bohr thought the model proposed by Ernest Rutherford did not describe the electrons in an atom correctly, why did he think this and how did his model of the atom differ from Rutherford?
- How did Bohr explain the lack of reactivity of the noble gases?
- What research led to the development of the quantum mechanical model of the atom and what is the major difference in this model compared to the Bohr model?

**Task 3: Types of Bonding Infographic (100 minutes)**

**25% of assessment/50 marks**

There are 50 marks for your infographic.

25/50 for knowledge and understanding. You need to show accurate use of properties, formation and elements involved in bonding.

15/50 for your overall evaluation and analysis of your research, making sure you appropriately cite sources.

10/50 for quality of visual communication. This includes use of references, imagery, legible text, and the use of correct scientific terminology throughout.

You have already learned a great deal about the types of bonding that occurs between different atoms at GCSE level. As you move into A Level, you will see that the big ideas surrounding bonding in ionic, covalent, and metallic bonds do not change. For this task, you will complete an infographic comparing ionic, covalent, and metallic bonds and their general properties.

Use an infographics maker to create a visual poster of the fundamental differences between the formation, properties, and types of elements involved for each type of bond. Some suggestions of online infographics creators to use would be Canva, Piktochart, Microsoft Sway, or PowerPoint. However, there is not set program that you must use.

You can hand in a hard copy of your infographic to your chemistry teacher in September, or send your infographic or a link to view it via email to Mrs J Harrier-Wilson: [jharrier-wilson@thehazeleyacademy.com](mailto:jharrier-wilson@thehazeleyacademy.com).

Consider these points:

- How ionic, covalent, and metallic bonds form
- The type of element(s) involved in each type of bonding
- General properties of each type of compound based on the effects of the bond
- The effect of the arrangement of particles in different states of matter on properties like electrical conductivity
- The roles of electrons in bonding.

#### **Task 4: Book Talk Presentation (220 minutes)**

**25% of assessment/50 marks**

There are 50 marks for your book talk which will take place during a lesson the week of September 14<sup>th</sup>. Your total marks will be determined by your ability to answer the provided book talk questions as well as answering follow up questions from your audience (classmates and teacher).

Choose one of the books from the Resources/Research section below. There are a variety of books that will help your chemistry knowledge and some link to other science fields like physics, biology, engineering, and medicine. Read the book and prepare a 3-5 minute book talk presentation that answers the question below. You do not need to produce any media (like a PowerPoint) for this talk.

Book Talk Questions:

- How did the book relate to the exam specification/what you think we will be learning in chemistry over the two-year course?
- What is the most interesting thing that you learned from the book?
- Why did you initially choose to read this book?
- How has reading this book helped your wider understanding of chemistry and/or how did the topic of this book relate to your possible career choice?
- Why do you recommend this book to anyone studying chemistry and/or why should someone interested chemistry read this book?

## Assessment

Your summer homework will be assessed using the criteria for each task indicated above. Your total points will be converted to a percentage, and a grade will be assigned to your summer homework following the grade boundaries indicated below. Failure to secure at least 40% of the marks for the summer homework may jeopardise your placement on the course.

Grade Boundaries:	80%	A
	70%	B
	60%	C
	50%	D
	40%	E
	<40%	U

## PLC

You will be given a PLC (Personal Learning Checklist) for the A Level content in September. You will be asked to RAG your understanding of the course based on the summer homework. After the transition lessons in September, you will be given a short assessment to test your further understanding. You will then be asked to RAG your understanding comparing where you were after your summer homework and where you are after the transition assessment.

## Resources/Research

### Book Talk Books

\*The Atom: Journey Across the Subatomic Cosmos – Isaac Asimov

Looks at the history of atomic and subatomic research from the ancient Greeks to modern particle physics.

Caesar's Last Breath: Decoding the Secrets of the Air Around Us

Takes you on a journey through the periodic table, around the globe, and across time to tell the story of the air we breathe, which it turns out, is also the story of earth and our existence on it.

Culinary Reactions: The Everyday Chemistry of Cooking – Simon Quellen Field

Exploring the scientific principles behind everyday recipes, this informative blend of lab book and cookbook reveals that cooks are actually chemists.

\*The Disappearing Spoon...and Other True Tales from the Periodic Table – Sam Keane

The periodic table is one of our crowning scientific achievements, but it's also a treasure trove of passion, adventure, betrayal, and obsession. The tales in this book follow every single element on the table as they play out their parts in human history.

\*Napoleon's Buttons: How 17 Molecules Changed History – Penny Le Couteur

Tells the stories of 17 molecules that greatly influenced the course of history.

\*Periodic Tales: The Curious Lives of the Elements – Hugh Aldersey-Williams

From ancient civilisations to contemporary culture, from the oxygen of publicity to the phosphorous in your pee, the elements are near and far and all around us.

The Poisoner's Handbook: Murder and the Birth of Forensic Medicine in Jazz Age New York – Deborah Blum

Draws from highly original research to track the fascinating, perilous days when a pair of forensic scientists began their trailblazing chemical detective work, fighting to end an era when untraceable poisons offered an easy path to the perfect crime.

Stuff Matters: Exploring the Marvellous Materials that Shape our Man-Made World – Mark Miodownik

From the teacup to the jet engine, the silicon chip to the paper clip, the plastic in our appliances to the plastic in our underpants, our lives are overflowing with materials. Full of tales of the miracles of engineering that permeate our lives.

Note: Books marked \* are available to read on [www.openlibrary.org](http://www.openlibrary.org) for free.

#### Websites and Video Playlists

Chemguide website: <http://chemguide.co.uk/>

OCR Chemistry A overview and specification: <https://www.ocr.org.uk/qualifications/as-and-a-level/chemistry-a-h032-h432-from-2015/>

Physics and Maths Tutor website: <https://www.physicsandmathstutor.com/chemistry-revision/a-level-ocr-a/>

Prep for A Level Chemistry YouTube Playlist:

<https://www.youtube.com/playlist?list=PLi6oabjl6coxUlfu8syK3K0iFXQIjwDUM>

Royal Society of Chemistry student website: <https://edu.rsc.org/student>

S'cool the Revision Website: <https://s-cool.co.uk/>

Starting A Level Chemistry YouTube Playlist:

<https://www.youtube.com/playlist?list=PLBE4lu9fm3bQdxiEncsJOCzwj6cGnzcXL>

#### **Wider Reading**

##### Books

In addition to the titles listed above in the Book Talk section, you may also find these helpful.

A Level Chemistry for OCR (Oxford) – Rob Ritchie and Dave Gent (you will be provided a copy of this textbook in September)

A Short History of Nearly Everything – Bill Bryson

Bad Science – Ben Goldacre

Calculations in AS / A Level Chemistry – Jim Clark

CGP Head Start to A-Level Chemistry (free Kindle edition)

Oxygen: The Molecule that Made the World – Nick Lane

The Science of Everyday Life – Marty Jopson

Superheavy: Making and Breaking the Periodic Table – Kit Chapman

What If? – Randall Munroe

Online Course:

Basic Science: Understanding Numbers from the Open University:

<https://www.open.edu/openlearn/science-maths-technology/basic-science-understanding-numbers/content-section-overview?active-tab=description-tab>

Science Journals:

ASC Central Science: <https://pubs.acs.org/toc/acscii/current>

Blusci from the University of Cambridge: <https://www.bluesci.co.uk/>

New Scientist: <https://www.newscientist.com/>

RSC Chemical Science: <https://pubs.rsc.org/en/journals/journalissues/sc#!recentarticles&adv>

Young Scientists Journal: <https://ysjournal.com/>

**All work must be submitted by Friday 11<sup>th</sup> September 2020**

**If you have questions about the work or the course, please contact Mrs J Harrier-Wilson via email: [jharrier-wilson@thehazeleyacademy.com](mailto:jharrier-wilson@thehazeleyacademy.com).**