

Subject: Chemistry

Teachers: Mr Wright, Mr Wade and Mr Tolley

Exam Board: AQA

NEWPORT GIRLS' HIGH SCHOOL KS5 CURRICULUM OVERVIEW

Curriculum Intent & Organisation

AQA A-Level chemistry taught at NGHS follows neatly from GCSE Chemistry, but rapidly increases in depth and challenge. The AQA course covers all areas of chemistry and the board sought advice from major universities to make sure that the course was both up-to-date and fully appropriate as a starting place for all relevant university courses with a chemistry requirement. The course is taught by three specialist chemistry teachers, who are all experts in each of the three branches of chemistry (Physical, Inorganic and Organic). By the end of the two year A-Level, our chemistry students will have gained a deeper understanding of the world around them and also an appreciation of the importance of chemistry to the modern world. Theory work is complemented by practical experiments that aims to reinforce the material learned.

Examination Information

At the end of the two-year course there are three examination papers of 2 hours:

- Paper 1 - physical and inorganic chemistry;
- Paper 2 – physical and organic chemistry;
- Paper 3 – all three branches and relevant practical work.

Practical skills are assessed by teachers as a separate certification, subject to exam board moderation.

Facilitating Subject?

Yes

Impact of Prior Learning from KS4

Students should have a sound understanding of the basics of: atomic structure; bonding and structure; quantitative chemistry; chemical changes, including acid-base reactions, redox, reactivity of metals and non-metals; rates of reaction and equilibria; organic chemistry; chemical analysis, both test tube and instrumental; atmospheric chemistry, including the greenhouse effect and other environmental aspects.

Summer work performs three functions: it attempts to get students who have studied combined Science courses to extend the basis of their knowledge to that of those who have studied chemistry as a single GCSE; it provides the students the opportunity to reflect on and extend their understanding of an area of chemistry that interests them prior to starting the course; allows the teachers to judge the scientific literacy of the students.

Equipment Required for this course

- Standard classroom stationery
- Mathematical calculator
- Own lined paper

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Curriculum Implementation – Areas of Focus Year 12

Autumn Term	Spring Term	Summer Term
<ul style="list-style-type: none">Physical: atomic structure; amount of substance; bonding;Organic: introduction to organic chemistry and mechanisms.Organic: alkanes, free radical substitution;	<ul style="list-style-type: none">Physical: redox; energetics; kinetics;Inorganic: periodicity; group II; group VIOrganic: halogenoalkanes; nucleophilic substitution and elimination; alcohols alkenes, electrophilic addition.	<ul style="list-style-type: none">Physical: kinetics; equilibria and Le Châtelier's principleOrganic: introduction to organic synthesis

• In addition, there are 6 assessed practicals: 3 physical, 1 inorganic and 2 organic.

Curriculum Implementation – Areas of Focus Year 13

Autumn Term	Spring Term	Summer Term
<ul style="list-style-type: none">Physical: Thermodynamics - ΔS, ΔG, Born-Haber cycles, hydration and solution enthalpies; rate expressions; equilibria in the gas phase, K_pOrganic: optical isomerism; aldehydes and ketones; carboxylic acids and their derivatives; aromatic chemistry; amines; polymers; amino acids, proteins and DNA.	<ul style="list-style-type: none">Physical: electrode potentials, electrochemical cells, redox; acid-base equilibria, strong and weak acids, pH, pK_a and K_w, buffersOrganic: synthesis; nuclear magnetic resonance spectroscopy (NMR); chromatography.Inorganic: patterns in the third period elements and oxides; transition metal chemistry; aqueous chemistry. complex ions and ligands.	<ul style="list-style-type: none">Inorganic: patterns in the third period elements and oxides; transition metal chemistry; aqueous chemistry. complex ions and ligands.

• In addition, there are 6 assessed practicals: 3 physical, 1 inorganic and 2 organic.

Impact / Outcomes

Learning will be assessed throughout the course by:

- End of unit tests involving past paper style questions typically with 30-35 marks.
- Homework questions, often using exam style questions.
- Ongoing lesson assessment for learning as part of teaching.
- End of year examination.

Homework / Self Study

Often involving exam style questions covering recent work covered in lessons. Worksheets may also be used to consolidate or complete learning from class. Occasionally, research maybe needed prior to an assessed practical and additional time to complete the write up and any subsidiary questions following the practical.

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Ways to support learning

- Recommended to purchase an additional textbook such as Collins Chemistry AQA A level year 1 and AS ISBN 978-0-00-759021-6. Revision guides and workbooks are also available from the same publisher.
- Suggested websites include Chemguide, A-level Chemistry and tutorials on channels such as Youtube.
- Revision guides and workbooks are also recommended to help with ongoing exam preparation.

Field Work / Extension / Enrichment Opportunities

- Regular visits to the West Midlands Chemistry Teachers lectures at Birmingham University
- Cambridge Chemistry Challenge for extending the high achievers.
- Chemistry Olympiad
- Mentoring younger pupils at KS3 and KS4 lunchtime drop ins

Next Steps

Chemistry A-Level leads directly onto university courses in many science and medical fields. Chemistry is a strong A-Level to choose and also gives access to a broad range of courses outside of science/medicine.

For more information, contact Mr Wright, Second in Science: Chemistry Lead.