

Chemistry Audit

Key concepts studied in GCSE chemistry, how secure is your understanding?

Task:

Go through the topics and give a number value regarding your understanding of the topic. Carry out some of the suggested activities to improve your understanding. Then go back over your audit at regular intervals and see how your understanding has developed (don't forget to date the times that you go through the audit).

Keep a folder of the work that you produce from these tasks to show your teacher(s) and include the audit. This will be regularly checked throughout your studies.

Topic	How secure is your understanding? (1 = not at all, 5 = very secure)	Suggested activities if you are unsure
Structure of the atom, properties of subatomic particles found in an atom, isotopes, drawing of atoms and drawing of ions		Visit: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/atomstrucrev1.shtml and make notes / diagrams about the structure of the atom. Watch this video about isotopes: https://www.youtube.com/watch?v=EboWeWmh5Pg and then make further notes Watch this video: https://www.youtube.com/watch?v=VWwC3k2723IM and make your own notes about ions – also look at ionic bonding
Periodic table, how the elements are arranged, what groups and periods are		Visit: http://www.bbc.co.uk/bitesize/standard/chemistry/elementsandreactions/periodic/revision/1/ and http://www.bbc.co.uk/education/guides/z84wjxs/revision and then annotate a periodic table to explain all the key concepts of it. A suitable periodic table can be found: http://filestore.aqa.org.uk/subjects/AQA-2420-W-TRB-PTDS.PDF
The periodic table and how we have changed the way that we have ordered the elements		Visit: http://www.bbc.co.uk/education/guides/zfn9q6f/revision and watch the video, look over the information and make your own notes / poster about the topic. OR create a story board / notes about all the different ways that scientist have changed their ideas about how to order the elements. Visit: http://www.rsc.org/periodic-table/history/about to support your understanding
Equations – word and symbol, how to balance them, conservation of mass during reactions		Visit the webpage: http://www.bbc.co.uk/education/guides/zqrxsbk/revision/3 or watch the video: https://www.youtube.com/watch?v=UGf60kq_ZDI Practise for work equations can be found: http://www.rsc.org/education/teachers/resources/afchem/resources/46/index.htm practise for symbol equations can be found: http://www.sciencegeek.net/APchemistry/APtaters/EquationBalancing.htm
Solids, liquids and gases – how they are arranged and what happens during changes of state		Visit: http://www.bbc.co.uk/education/guides/z2wmxnb/revision/4 and make notes comparing solids, liquids and gases. Draw a diagram showing something going from a solid to a liquid to a gas and annotate about what the particles are doing and the energy that the particles have. This website will support you: http://www.schoolphysics.co.uk/age14-16/Heat%20Energy/Heat%20Energy/text/Change_of_state/index.html
Metals and non-metals their properties and how that relates to their structure		Create a Venn diagram comparing metals and non-metals. Websites that might help include: http://www.bbc.co.uk/bitesize/ks3/science/chemical_material_behaviour/atoms_elements/revision/7/ http://www.s-cool.co.uk/gcse/chemistry/metals-the-reactivity-series/revise-it/properties-of-metals-and-non-metals
Acids, alkalis, bases, pH, neutralisation		Make a revision poster about this topic. Websites that will support you include: http://www.bbc.co.uk/schools/gcsebitesize/science/add_gateway_pre_2011/chemical/acidsrev3.shtml http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/acids/acidsbasesrev1.shtml http://www.gcscience.com/aa36.htm http://www.docbrown.info/page03/AcidsBasesSalts.htm
Reactions of acids with alkalis, metals, metal oxides and metal carbonates		Add to a mindmap about acids etc from above and use the following websites to help you: http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_pre_2011/chemical_synthesis/acids_alkalisrev3.shtml http://www.chemistryrules.me.uk/junior/acids.htm
Metals and their properties, metallic bonding and how it relates to metals properties		Draw a diagram about metallic bonding and add information to the diagram about how the structure accounts for the metals properties. Maybe add to the information that you have created comparing metals and non-metals? Websites to help include: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/differentsubrev5.shtml https://en.wikipedia.org/wiki/Metallic_bonding https://www.boundless.com/chemistry/textbooks/boundless-chemistry-textbook/liquids-and-solids-11/crystals-and-band-theory-88/bonding-in-metals-the-electron-sea-model-388-3602/
Reactions of group 1 metals with water, oxygen and chlorine, trends of group 1		Write down the elements and then explain the trends and properties that group 1 metals have. Websites that will help are: http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/fundamentals/theperiodictablerev2.shtml

metals and why they have their trends		http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/periodic_table/group1rev1.shtml http://www.chemguide.co.uk/inorganic/group1/reacto2.html
Extracting metals using carbon and electrolysis, uses of metals, extraction of aluminium		<p>Make notes about the reactivity series. Make notes comparing the different ways to extract metals and link into the reactivity series. Also create diagrams looking at how aluminium is extracted. These websites will support your notes:</p> <p>http://www.bbc.co.uk/education/guides/zqwmxbn/revision/4 http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_pre_2011/chemicals/extractionmetalsrev1.shtml http://www.chemguide.co.uk/inorganic/extraction/introduction.html</p>
Alloys, their uses, how adding other elements to metals can affect their properties		<p>Draw a diagram of an alloy and compare to a diagram of a metal. Use the internet to add to your notes about different types of alloys and how adding elements affects the properties of these metals. http://www.bbc.co.uk/education/guides/zfsk7ty/revision/6 http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/rocks/metalsrev3.shtml</p>
Transition metals and their properties		<p>Draw on a periodic table where the transition metals are, find some typical transition metals and identify their properties. Also make a note of common properties of transition metals. Websites to support you are:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel_pre_2011/patterns/transitionmetalsrev1.shtml http://www.s-cool.co.uk/a-level/chemistry/transition-metals/revise-it/physical-properties-of-transition-metals http://www.4college.co.uk/a/ss/varoxidation.php</p>
Crude oil, formation, extraction, fractional distillation, uses of the fractions (including cracking)		<p>Create a poster or notes about crude oil and how it is formed and extracted, how fractional distillation works, what we used the fractions for and how cracking turns long chain alkanes into shorter alkanes and a small alkene. Include equations where possible. Websites to support you include:</p> <p>http://www.bbc.co.uk/bitesize/standard/chemistry/materialsfromoil/how_crude_oil_was_formed/revision/1/ http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/carbon_chem/4_crude_oil1.shtml http://www.bbc.co.uk/education/guides/zm2v4wx/revision https://www.youtube.com/watch?v=KC51F_44dy4 http://www.gcscience.com/o5.htm http://www.docbrown.info/page04/OilProducts02.htm http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/oils/polymersrev1.shtml http://www.chemguide.co.uk/organicprops/alkanes/cracking.html</p>
Organic chemistry 1 – alkanes, alkenes, how they are named, diagrams, detection		<p>Make a table comparing alkanes and alkenes, what is similar about them, what is different about them, how are they named, what type of bonding is between the atoms, what do they do with water and group 1 metals, which molecule is more reactive and why, what is produced when they are burnt in excess and limited oxygen, how can you tell the difference between them chemically. Some websites to support your understanding:</p> <p>http://www.bbc.co.uk/education/guides/zvwxnb/revision https://www.youtube.com/watch?v=Sfm3eHe57PU http://www.chemistryrules.me.uk/junior/organic.htm http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/carbon_chem/5_making_polymers2.shtml</p>
Organic chemistry 2 – alcohols, carboxylic acids, how they are named, diagrams, properties		<p>Make an organic mindmap (build on your understanding about alkanes and alkenes). Look at how alcohols and what their function group is, how they are named, how they are formed (chemical synthesis, fermentation and biotechnology) and their reactions with group 1. Also find out why alcohols will mix with water and look at alcohols physical properties linked to their structure. Find out about the uses of alcohol.</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/triple_ocr_21c/further_chemistry/alcohols/revision/1/ http://www.chemguide.co.uk/organicprops/alcohols/background.html</p> <p>Find out the functional group of carboxylic acids, how they are made, what their physical properties are linked to their structure. How are carboxylic acids made and what are they used for?</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/triple_aqa/alcohols_carboxylic_acids_esters/carboxylic_acids/revision/1/ http://www.chemguide.co.uk/organicprops/acidmenu.html http://www.bbc.co.uk/education/guides/z33j6sg/revision</p>
Organic chemistry 3 – esters, how they are made, named, diagrams		<p>Build on your organic mindmap about organic chemistry and make sure you understand about carboxylic acids and alcohols. Find out the stages of making an ester, the equipment used and why it is used, how esters are named, what their properties are and their uses. Websites that might help are:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/triple_aqa/alcohols_carboxylic_acids_esters/esters/revision/1/ http://www.chemguide.co.uk/organicprops/esters/background.html http://www.bbc.co.uk/schools/gcsebitesize/science/triple_ocr_21c/further_chemistry/carboxylic_acids_esters/revision/1/</p>
Combustion of hydrocarbons – complete and incomplete combustion		<p>Make notes about complete and incomplete combustion of hydrocarbons. Include word and symbol equations of the processes. Add to it problems that complete and incomplete combustion cause. Websites to support you include:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/crudeoil/hydrocarbonsrev1.shtml http://lchs.lpsd.ca/eteacher_download/2112/34962 http://www.bbc.co.uk/education/guides/z6xbkqt/revision</p>

How air pollutants are formed by combustion of hydrocarbons, what damage they do and how they can be prevented or cleaned up		Visit: http://www.bbc.co.uk/schools/gcsebitesize/science/21c/air_quality/chemicals_airrev2.shtml and make notes Visit: http://www.bbc.co.uk/schools/gcsebitesize/science/21c/air_quality/improving_air_qualityrev2.shtml and make notes about different ways to clean up our air
Global warming and global dimming, how they are caused and how can they be prevented		Make sure that you have understood complete and incomplete combustion. Then create a poster explaining global warming and global dimming. Create a Venn diagram comparing both global warming and global dimming – what is the same and what is different. Websites to support you include: http://www.bbc.co.uk/schools/gcsebitesize/science/aga_pre_2011/rocks/fuelsrev6.shtml http://www.bbc.co.uk/schools/gcsebitesize/science/21c/radiation_life/global_warmingrev3.shtml http://www.bbc.co.uk/schools/gcsebitesize/science/aga_pre_2011/rocks/fuelsrev7.shtml http://www.knockhardy.org.uk/sci_htm_files/08air.pdf
Cracking of alkanes to make alkenes, uses of alkenes in the making of polymers		See the earlier section about fractional distillation and add to that if unsure. Once you are aware of how crude oil is made, extracted and fractional distillation focus on how long chain alkane is turned into a shorter alkane and a small alkene. Extend yourself further looking at the different types of cracking. Make further notes / diagrams about additional polymers focusing on what the monomer, polymer and repeating unit look like. Websites to guide you include: http://www.bbc.co.uk/schools/gcsebitesize/science/aga/substancesfromcrudeoil/alkenesrev1.shtml http://www.chemguide.co.uk/organicprops/alkanes/cracking.html http://www.bbc.co.uk/education/guides/zm2v4wx/revision/2 http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/carbon_chem/5_making_polymers3.shtml http://www.chemguide.co.uk/organicprops/alkenes/polymerisation.html
How polymers can be modified and how the modification affects the polymers property		Make a table comparing how polymers can be modified. How do these polymers affect the intermolecular bonds and therefore the melting point, can you illustrate what the structure looks like? Websites to support you include: http://www.bbc.co.uk/schools/gcsebitesize/science/21c_pre_2011/materials/molecstructpropertiesrev2.shtml http://www.bbc.co.uk/schools/gcsebitesize/science/21c/materials_choices/structure_materialsrev1.shtml https://www.youtube.com/watch?v=QIm49U11VLg
Formation of ions, ionic bonding and how to illustrate		Make notes explaining what ions are, what they look like, what group the element is and how does that relate to the ion that it forms. Draw a diagram of an ionic structure and identify the properties of ionic compounds related to their structure. Websites to support your notes: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/ionicrev1.shtml https://www.youtube.com/watch?v=Bfg9pg3Whmw http://www2.hkedcity.net/sch_files/a/lsc/lsc-chem/public_html/nss/fundamental/bonding/ionic/formation.htm Maybe create a table about all the different types of structures and compare them?
Properties of ionic compounds linked to their structure and bonding		Make sure you are happy with the content about ions from above. Draw a diagram of an ionic lattice and annotate with information about how its structure relates to its properties. Websites that might guide you are: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/differentsubrev1.shtml http://www.chemguide.co.uk/atoms/structures/ionicstruct.html Maybe create a table about all the different types of structures and compare them?
Covalent bonding, diagrams to show covalent bonding		Draw a diagram of covalent bonding. Can you relate this to giant covalent structures and simple molecular structures? Create a set of rules about covalent bonding. These websites might support you: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/covalentrev3.shtml http://www.chemguide.co.uk/atoms/bonding/covalent.html Maybe create a table about all the different types of structures and compare them?
Simple molecular structures, their properties and how it related to their structure		Make notes or a poster about this topic. The website: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/differentsubrev2.shtml can help you. Maybe create a table about all the different types of structures and compare them?
Giant covalent / macromolecular, their structures and how that relates to their properties		Create notes and draw diagrams about giant covalent structures (macromolecular) and include information about how the structure of giant covalent affects their properties. Websites to use: http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/bonding/structure_propertiesrev2.shtml http://www.chemguide.co.uk/atoms/structures/giantcov.html http://www.docbrown.info/page04/4_72bond4.htm Maybe create a table about all the different types of structures and compare them? http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=15&ved=0ahUKewjEp6u2jbjUAhUJcAKHYCFAlMQFghzMA4&url=http%3A%2F%2Fwebsites.lstlcw.edu.hk%2F9541%2Fflauka%2F%2F%2Fchemistry%2FPhy%2520Chem%2520Notes%2Fbondings%2520Structure%2520%26%2520Properties.doc&usg=AFQjCNGUB95ZrMyfQicZnYYf9hklegfDtA
Group 7 – their properties, reactions with group 1, displacement reactions involving the halogens, their		Create a poster / notes about group 7 and their properties – can you relate it to their simple molecular structure. What are the colours of the halogens and their state at room temperature? Explain why the top of the group is more reactive than the bottom of the group. Find out about uses of the halogens. What happens when the halogens react with iron? How do we test for the halogens? What happens when a more reactive halogen is added to a metal halide and why – include ionic equations. Webpages to support you include:

uses, reactions with iron and testing for the halogens		http://www.bbc.co.uk/education/guides/z3vwxnb/revision http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_pre_2011/periodic_table/group7rev_1.shtml http://www.chemguide.co.uk/inorganic/group7menu.html http://www.docbrown.info/page07/ASA2group7a.htm
Reversible reactions and dynamic equilibrium		<p>Create notes / mindmaps / poster explaining what a reversible reaction is. What is dynamic equilibrium and how what is Le Chatelier's principle.</p> <p>http://www.bbc.co.uk/education/guides/z7qfr82/revision http://www.bbc.co.uk/bitesize/higher/chemistry/reactions/equilibrium/revision/1/ http://www.chemguide.co.uk/physical/equilibria/introduction.html http://www.chemguide.co.uk/physical/equilibria/lechatelier.html</p> <p>Watch these videos to support your understanding:</p> <p>https://www.youtube.com/watch?v=br8lKynV1Hc https://www.youtube.com/watch?v=g5wNg_dKsYY https://www.youtube.com/watch?v=wID_ImYQAgQ https://www.youtube.com/watch?v=7zuUV455zFs https://www.youtube.com/watch?v=XhQ02egUs5Y</p>
The Haber process and how the reversible reaction is used to generate the most ammonia		<p>Make a poster explaining what the Haber process is, why it is needed, how the process is manipulated to optimise ammonia production, why ammonia is needed. Websites to help include:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/add_gateway_pre_2011/chemical/ammonia/ev2.shtml http://www.bbc.co.uk/education/guides/zrg7hyc/revision/2 https://www.youtube.com/watch?v=NWhZ77Qm5y4 http://www.chemguide.co.uk/physical/equilibria/haber.html</p>
What factors affect the rate of a chemical reaction and why		<p>Explain what is needed for a chemical reaction to take place. These websites might help you:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/rocks_metals/7_faster_slower1.shtml http://www.chemguide.co.uk/physical/basicrates/introduction.html</p> <p>Make notes about the different factors that can affect the rate of a chemical reaction. These websites might help you:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/chemreac/ratesrev2.shtml http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_pre_2011/chemical_synthesis/rate_reactionrev2.shtml</p>
How to measure the rate of a chemical reaction		<p>Think about the different types of reactions that happen and how you know that a reaction has taken place – a colour change, a precipitate is forming, gas is given off, there is a change in mass. Then think about how you would measure the changes. Make notes / diagrams about how you would do this. What sources of error are there with the methods that you have given? These websites will help you:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/chemreac/ratesrev1.shtml http://www.bbc.co.uk/education/guides/zwdp34j/revision http://www.s-cool.co.uk/gcse/chemistry/rates-of-reaction/revise-it/the-rate-of-a-chemical-reaction http://www.gcsescience.com/rc-measuring-rate-reaction.htm</p>
Exothermic and endothermic reactions Energy profiles of reactions including calculations of reactions		<p>Make notes explaining the energy involved in breaking and making new bonds during a chemical reaction. Include how you can calculate the energy released or taken in during a chemical reaction. These websites will guide you:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/science/triple_ocr_21c/further_chemistry/energy_changes_chemistry/revision/2/ http://www.bbc.co.uk/schools/gcsebitesize/science/add_edexcel/chemical_reactions/energychangesrev2.shtml http://www.bbc.co.uk/education/guides/zsn9q6f/revision</p> <p>Make a revision poster comparing exothermic and endothermic reactions. The following websites, some with videos, might guide you:</p> <p>https://www.youtube.com/watch?v=eJXL0lrbtqE http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/exothermic/exothermic_endothermicrev1.shtml</p> <p>Draw some energy diagram profiles (including activation energy) to show the similarities and differences between exothermic and endothermic reactions. The following websites in addition to the above ones will help you:</p> <p>http://www.chemguide.co.uk/physical/basicrates/energyprofiles.html http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_21c/chemical_synthesis/whychemicalsrev9.shtml</p>
Redox including half equations and relating to electrolysis		<p>Make sure you understand what oxidation and reduction are with regards to oxygen and electrons. Find out further information about redox reactions and look at the reactions that take place during electrolysis. Include annotated diagrams about the reactions that take place at the electrodes. Websites include:</p> <p>http://www.bbc.co.uk/bitesize/higher/chemistry/reactions/redox/revision/1/ http://www.gcsescience.com/r7-oxidation-reduction-redox.htm http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/ions/electrolysisrev1.shtml</p>
The structure of the earth and the rock cycle		<p>Draw a diagram of the earth's structure and annotate with information. Websites that might help are:</p> <p>http://www.bbc.co.uk/schools/gcsebitesize/geography/natural_hazards/tectonic_plates_rev1.shtml http://www.bbc.co.uk/education/guides/zysbgk7/revision</p>

		<p>Draw the rock cycle and explain how the different rocks are formed. Websites that might help are:</p> <p>http://www.bbc.co.uk/bitesize/ks3/science/environment_earth_universe/rock_cycle/revision/1/ http://www.cotf.edu/ete/modules/mse/earthsysflr/rock.html</p> <p>Add the diagrams / notes together – how does the rock cycle relate to the earth's structure?</p>
The gases in our atmosphere, how they formed and their role in today's atmosphere		<p>Visit: http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/earth/earthsatmosphererev1.shtml and make notes about how the atmosphere has changed.</p> <p>Make a table about the main gases in our atmosphere and their uses.</p> <p>Can you extend and look at how pollutants are affecting the quality of your air and the role that this will have in the future?</p>

Chemical calculations

- Be able to turn cm^3 into dm^3 into m^3
- Be able to calculate relative atomic mass and relative formula mass
- Be able to calculate reacting masses
- Be able to calculate expected yield
- Be able to calculate percentage yield
- Be able to calculate the empirical formula
- Be able to calculate the atom economy of a reaction
- Be able to calculate moles
- Be able to calculate concentration in g/dm^3
- Be able to calculate concentration in mol/dm^3
- Be able to change mol/dm^3 into g/dm^3 and vice versa

Practical skills to know:

Evaporation

Filtration

Distillation

Cracking

Heating under reflux

Chromatography

Measuring the rates of chemical reactions – colour change due to precipitate formation, collection of gas, loss in mass

Measuring the temperature change of combustion of a fuel

Measuring the energy change of a displacement reaction

Measuring the energy change of a neutralisation reaction

Electrolysis of solutions

Testing for hydrogen, oxygen, carbon dioxide, chlorine

Measuring the pH using indicators and pH probes

Titration

Precipitate reactions

Testing for anions and cations

Next steps

Make sure with A level chemistry that you are always reading ahead and preparing for your lessons. Use your text book and the online text books from kerboodle.

Use the following websites to supplement your notes:

<http://www.chemguide.co.uk/>

<http://www.a-levelchemistry.co.uk/new-aqa-a-level-chemistry.html>

Watch videos:

<https://www.youtube.com/user/MrERintoul>

https://www.youtube.com/watch?v=2iqUB_N-uzw (videos about the required practical's)