

Year: Y13

Subject: Chemistry

General extras:

Catalyst magazine - <https://catalyst-magazine.org/>

Future Learn - search for short courses of interest, most can be completed for free www.futurelearn.com

Chemistry Word - <https://www.chemistryworld.com/>

Nature - <https://www.nature.com/>

Careers in chemistry -

<https://edu.rsc.org/future-in-chemistry/career-options/job-profiles/careers-in-chemistry-a-to-z>

Careers in the pharmaceutical industry -

<https://www.abpi.org.uk/careers/>

Careers in biochemistry -

<https://www.biochemistry.org/careers-and-education/careers/career-options/>

Careers in physics -

<https://www.iop.org/careers-physics/your-future-with-physics/career-paths>

Recommended books:

Chemistry

The disappearing spoon by Sam Kean

Uncle Tungsten – memories of a chemical boyhood by Oliver Sacks

Periodic tales: The curious lives of the elements by Hugh

Aldersey-Williams

The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson

The Disappearing Spoon...and other true tales from the Periodic Table by Sam Kean

Stuff Matters: Exploring the Marvellous Materials That Shape Our Man-Made World by Mark Miodownik

General science

A short history of nearly everything by Bill Bryson

8000 metres climbing the world's highest mountains by Alan Hinkes

Bad Science by Ben Goldacre

Medicine

Brave new world by Aldous Huxley

The man who mistook his wife for a hat by Oliver Sacks

The ghost map by Steven Berlin Johnson

Happy accidents: Serendipity in modern medical breakthroughs by Morton A. Meyers

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
3A Y12	4 - 5	Practicals				Distillation https://www.youtube.com/watch?v=aUEpAEaSsBU&list=PLAd0MSIZBSsFqr5zjTGhaqoag-jgKy-Yx&index=1&pp=iAQB Rates https://www.youtube.com/watch?v=ijdgIGENBKI&list=PLAd0MSIZBSsFqr5zjTGhaqoag-jgKy-Yx&index=3 Aspirin https://www.youtube.com/watch?v=sZY0XFuQsfU&list=PLirSlc28B6U1_MHY4GRhV3h3dD_uD_q4t&index=13&pp=iAQB https://www.youtube.com/watch?v=HeEXBGBShdl&list=PLirSlc28B6U1_MHY4GRhV3h3dD_uD_q4t&index=12&pp=iAQB https://www.youtube.com/watch?v=z3D9Hswtlxs&list=PLirSlc28B6U1_MHY4GRhV3h3dD_uD_q4t&index=21&pp=iAQB Melting point determination https://www.youtube.com/watch?v=loEOV-botCk

	5	Practicals				Organic liquid https://www.youtube.com/watch?v=U3DeQVG_I5A&list=PLirSlc28B6U1_MHY4GRhV3h3cD_uD_q4t&index=7
	6	Thermodynamics	The further study of thermodynamics builds on the Energetics section and is important in understanding the stability of compounds and why chemical reactions occur. Enthalpy change is linked with entropy change enabling the free-energy change to be calculated.	3.1.8	<ol style="list-style-type: none"> 1. Lattice enthalpy https://www.chemguide.co.uk/physical/energetics/lattice.html#top 2. Enthalpy of solution https://www.chemguide.co.uk/physical/energetics/solution.html#top 3. Enthalpy of neutralisation https://www.chemguide.co.uk/physical/energetics/neutralisation.html#top 4. Entropy https://www.chemguide.co.uk/physical/entropy/introduction.html#top 5. Calculating entropy https://www.chemguide.co.uk/physical/entropy/entropychange.html#top 	Quiz https://app.carousel-learning.com/quiz/b616e028-abcc-48cf-8c98-e2498ed910c1 <ol style="list-style-type: none"> 1. Lattice enthalpy https://www.youtube.com/watch?v=scfHiKHSu0E&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=1&p=iAQB 2. Lattice enthalpy https://www.youtube.com/watch?v=_jQaz_uaHI&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=2&p=iAQB 3. Lattice enthalpy https://www.youtube.com/watch?v=BPKR PD91c8&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=3&p=iAQB 4. Aluminium oxide https://www.youtube.com/watch?v=Ci3pid
	7	Thermodynamics		3.1.8		

					<p>6. Gibbs free energy https://www.chemguide.co.uk/physical/entropy/deltag.html#top</p>	<p>eIBd8&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=4&pp=iAQB</p> <p>5. Enthalpy of solution https://www.youtube.com/watch?v=ASiySWEoMhI&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=5&pp=iAQB</p> <p>6. Enthalpy of solution https://www.youtube.com/watch?v=4UsB7dWT-XQ&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=6&pp=iAQB</p> <p>7. Enthalpy of solution https://www.youtube.com/watch?v=7OvHF7YOa9w&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=7&pp=iAQB</p> <p>8. Entropy https://www.youtube.com/watch?v=I8Xd5MN5cMg&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=8&pp=iAQB</p> <p>9. Entropy https://www.youtube.com/watch?v=8V4KCJC19ac&list=PLi6oabjl6coxbrrG7w2tD715l</p>
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						Tjlq8atT&index=9&pp=iAQB 10. Finding temperature at which reaction becomes feasible https://www.youtube.com/watch?v=1si2skwotXA&list=PLi6oabjl6coxbrrG7w2tD7l5ITjlq8atT&index=10&pp=iAQB
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Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
3B Y12	1	Thermodynamics		3.1.8		
	2	Rate equations	In rate equations, the mathematical relationship between rate of reaction and concentration gives information about the mechanism of a reaction that may occur in several steps.	3.1.9	1. Orders of reaction https://www.chemguide.co.uk/physical/basicrates/orders.html#top 2. Orders of reaction https://www.chemguide.co.uk/physical/basicrates/ordermech.html#top 3. Practicals https://www.chemguide.co.uk/physical/basicrates/experimental.html#top 4. Arrhenius equation https://www.chemguide.co.uk/physical/basicrates/arrhenius.html#top	Quiz https://app.carousel-learning.com/quiz/7147a7f8-c92f-4965-9736-07f3fbbbe6c4 Videos 1. Orders of reaction https://www.youtube.com/watch?v=RN_f1qp83bM&list=PLi6oabjl6cowDU_ykFyz0xjsspssaq5p2p&index=1&pp=iAQB 2. Order and half life (extra) https://www.youtube.com/watch?v=IDKxnNU6Y0Q&list=PLi6oabjl6cowDU_ykFyz0xjsspssaq5p2p&index=2&pp=iAQB
	3	Rate equations		3.1.9		

						<ol style="list-style-type: none">3. Rete equations https://www.youtube.com/watch?v=QLRejvdJkus&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=3&pp=iAQB4. Finding units for k https://www.youtube.com/watch?v=hGHIXxskTs8&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=4&pp=iAQB5. Initial rates https://www.youtube.com/watch?v=EIOLXRXeNLw&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=5&pp=iAQB6. Initial rates https://www.youtube.com/watch?v=p6NrCbZOdJo&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=6&pp=iAQB7. Rate determining step https://www.youtube.com/watch?v=oPFZR0Ut4Gk&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=7&pp=iAQB
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						<p>8. Rate determining step https://www.youtube.com/watch?v=KZDRofmuctQ&list=PLi6oabjl6cowDU_ykFyz0xjspssaq5p2p&index=8&pp=iAQB</p> <p>9. Arrhenius equation https://www.youtube.com/watch?v=BUfXEYpq3Ds&list=PLi6oabjl6cowDU_ykFyz0xjspssaq5p2p&index=9&pp=iAQB</p> <p>10. Arrhenius equation https://www.youtube.com/watch?v=vW--uF9VzjQ&list=PLi6oabjl6cowDU_ykFyz0xjspssaq5p2p&index=10&pp=iAQB</p> <p>11. Arrhenius graphs https://www.youtube.com/watch?v=AwFbl dz1aK4&list=PLi6oabjl6cowDU_ykFyz0xjspssaq5p2p&index=11&pp=iAQB</p>
4	Aldehydes, ketones, optical isomerism	Aldehydes, ketones, carboxylic acids and their derivatives all contain the carbonyl group which is attacked by nucleophiles. This section includes the addition reactions of aldehydes and ketones.	3.3.7 +3.3.8	<p>1. Addition-elimination reactions https://www.chemguide.co.uk/organicprocs/carbonyls/addelim.html#top</p> <p>2. Optical isomerism https://www.chemguide.co.uk/organicprocs/opticalisomerism.html</p>	<p>Quiz https://app.carousel-learning.com/quiz/cddf143c-8f33-4590-9d2a-9540d4f764e4</p> <p>Videos 1. Introduction https://www.youtube.com/watch?v=AwFbl dz1aK4</p>	

					uide.co.uk/basicorg/isomerism/optical.html	com/watch?v=oui5g4ycd6M 2. Naming aldehydes https://www.youtube.com/watch?v=v4TDZLPitCA 3. Naming ketones https://www.youtube.com/watch?v=7BolaKjEFZY 4. Testing https://www.youtube.com/watch?v=vvvvgOxWpsY 5. Oxidation and reduction https://www.youtube.com/watch?v=2K_rn3YQgIY 6. Reduction mechanism https://www.youtube.com/watch?v=sxjuBj6vrsU 7. Chirality and drugs https://www.youtube.com/watch?v=J47Nv_6-T2M 9.
5	Carboxylic acids	Carboxylic acids are weak acids but strong enough to liberate carbon dioxide from carbonates. Esters occur naturally in vegetable oils and animal fats.	3.1.9	1. Introduction https://www.chemguide.co.uk/organicpropr/ acids/background.html#top 2. Making carboxylic acids	Quiz https://app.carousel-learning.com/quiz/0a4f1a3c-b476-4b13-8fe9-2795acf275ef Videos	

			Important products obtained from esters include biodiesel, soap and glycerol.		<p>https://www.chemguide.co.uk/organicpro/acid/preparation.html#top</p> <p>3. Acidic properties https://www.chemguide.co.uk/organicpro/acid/acidity.html#top</p> <p>4. Esterification https://www.chemguide.co.uk/organicpro/acid/esterification.html#top</p> <p>5. Reduction https://www.chemguide.co.uk/organicpro/acid/reduction.html#top</p> <p>6. Acyl chlorides https://www.chemguide.co.uk/organicpro/acid/pcl5.html#top</p> <p>7. https://www.chemguide.co.uk/organicpro/acid/decarbox.html#top</p>	<ol style="list-style-type: none"> 1. Introduction https://www.youtube.com/watch?v=d9X5T5NXkbA 2. Naming carboxylic acids https://www.youtube.com/watch?v=EyrYj4jRjRs 3. Reactions https://www.youtube.com/watch?v=dEIEZ6TYdi0 4. Esters https://www.youtube.com/watch?v=LUmBK_Cu9RA 5. Esterification https://www.youtube.com/watch?v=H51yz8s5IkY 6. Hydrolysis of esters https://www.youtube.com/watch?v=iMHRf83TZTo 8. Triglycerides https://www.youtube.com/watch?v=GdTn23h7Sek 9. Acyl chlorides intro https://www.youtube.com/watch?v=Sur_cc86rXc 10. Reactions of acyl chlorides https://www.youtube.com/watch?v=Sur_cc86rXc
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						com/watch?v=sOpFD1rHtZ4

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
1A Y13	1	Carboxylic acids		3.1.9		
	2	Carboxylic acids		3.1.9		
	3	K _p	The further study of equilibria considers how the mathematical expression for the equilibrium constant K_p enables us to calculate how an equilibrium yield will be influenced by the partial pressures of reactants and products. This has important consequences for many industrial processes.	3.1.10	K _p https://www.chemguide.co.uk/physical/equilibria/kp.html #top	Quiz https://app.carousel-learning.com/quiz/bed5e11e-035c-4159-8e45-b3a974e11ae2 1. K _p https://www.youtube.com/watch?v=jjHCi9Neu0o&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=17&pp=iAQ_B 2. K _p calculations https://www.youtube.com/watch?v=0uY4gFt9vDg&list=PLi6oabjl6cowDU_yK

						Fyz0xjspssaq5p2p&index=18&pp=iAQ B 3. Kp calculations https://www.youtube.com/watch?v=yiph-EQm05l&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=19&pp=iAQ B 4. Kp calculations https://www.youtube.com/watch?v=HAZlcxg3G30&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=20&pp=iAQ B
4	Acids and bases	Acids and bases are important in domestic, environmental and industrial contexts. Acidity in aqueous solutions is caused by hydrogen ions and a	3.1.12	1. Theory/definitions https://www.chemguide.co.uk/physical/acidbaseeqia/theories.html#top 2. Strong and weak acids https://www.chemg	Quiz https://app.carousel-learning.com/quiz/319d80c7-7fd7-4884-9872-18aabf84bb83 1. Introduction https://www.youtube.	

			<p>logarithmic scale, pH, has been devised to measure acidity. Buffer solutions, which can be made from partially neutralised weak acids, resist changes in pH and find many important industrial and biological applications.</p>		<p>uide.co.uk/physical/acidbaseeqia/acids.html#top</p> <p>3. Kw https://www.chemguide.co.uk/physical/acidbaseeqia/kw.html#top</p> <p>4. Strong and weak bases https://www.chemguide.co.uk/physical/acidbaseeqia/bases.html#top</p> <p>5. pH curves https://www.chemguide.co.uk/physical/acidbaseeqia/phcurves.html#top</p> <p>6. Indicators https://www.chemguide.co.uk/physical/acidbaseeqia/indicators.html#top</p> <p>7. Buffer solutions https://www.chemguide.co.uk/physical/acidbaseeqia/buffers.html#top</p>	<p>com/watch?v=Pcrb5ztoezw&list=PLi6oabjl6cowDU_yKFyz0xjsspssaq5p2p&index=21&pp=iAQB</p> <p>2. pH of strong acid https://www.youtube.com/watch?v=eYO5GErXQN4&list=PLi6oabjl6cowDU_yKFyz0xjsspssaq5p2p&index=22&pp=iAQB</p> <p>3. Weak acids - K_a https://www.youtube.com/watch?v=9RleGhfRSbM&list=PLi6oabjl6cowDU_yKFyz0xjsspssaq5p2p&index=23&pp=iAQB</p> <p>4. pH of weak acids https://www.youtube.com/watch?v=ZlMokznLvuk&list=PLi6oabjl6cowDU_yKFyz0xjsspssaq5p2p&index=24&pp=iAQB</p> <p>5. Weak acid assumptions https://www.youtube.com/watch?v=EtUqS0h0wPc&list=PLi6oabjl6cowDU_yKFyz0xjsspssaq5p2p&index=25&pp=iAQB</p> <p>6. Kw https://www.youtube.com/watch?v=tCfeg</p>
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						<p>nWdoM&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=26&pp=iAQB</p> <p>7. pH of strong bases https://www.youtube.com/watch?v=5ZY4d2nLQDs&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=27&pp=iAQB</p> <p>8. Buffer solutions https://www.youtube.com/watch?v=PD0ycVIGtTQ&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=28&pp=iAQB</p> <p>9. Buffer calculations https://www.youtube.com/watch?v=xDRyGAQTRgQ&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=29&pp=iAQB</p> <p>10. Buffer calculations https://www.youtube.com/watch?v=tsS_T2Cph28&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=30&pp=iAQB</p> <p>11. strong acid - strong base https://www.youtube.com/watch?v=FPKl3f4lpJ0&list=PLi6oabjl</p>
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					6cowDU_yKFyz0xjspssaq5p2p&index=31&pp=iAQB 12. strong acid - weak base https://www.youtube.com/watch?v=tVHf4ZQgoCc&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=32&pp=iAQB 13. weak acid - strong base https://www.youtube.com/watch?v=cKQBW7Suoi4&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=33&pp=iAQB 14. weak acid - weak base https://www.youtube.com/watch?v=mU3UkjDIEa4&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=34&pp=iAQB 15. Indicators https://www.youtube.com/watch?v=ETPKi0uLS4U&list=PLi6oabjl6cowDU_yKFyz0xjspssaq5p2p&index=35&pp=iAQB
5	Acids and bases		3.1.12		
6	Acids and bases		3.1.12		

	7	Aromatic chemistry	Aromatic chemistry takes benzene as an example of this type of molecule and looks at the structure of the benzene ring and its substitution reactions	3.3.10	<ol style="list-style-type: none"> 1. Introduction https://www.chemguide.co.uk/organicprops/arenes/background.html#top 2. https://www.chemguide.co.uk/organicprops/arenes/manufacture.html#top 3. Nitration of benzene https://www.chemguide.co.uk/organicprops/arenes/nitration.html#top 4. Halogenation of benzene https://www.chemguide.co.uk/organicprops/arenes/halogenation.html#top 5. Friedel-Crafts Acylation https://www.chemguide.co.uk/organicprops/arenes/fc.html#top 6. Other reactions https://www.chemguide.co.uk/organicprops/arenes/other.html#top 7. 	<p>Quiz https://app.carousel-learning.com/quiz/2c299f1d-ec40-40e7-ac41-a3cb6a85ffc6</p> <p>Videos</p> <ol style="list-style-type: none"> 1. Naming aromatic compounds https://www.youtube.com/watch?v=wu3HJeb5Jr0 2. Structure and bonding in benzene https://www.youtube.com/watch?v=g6eLwkYne0g 3. Explaining bonding in benzene https://www.youtube.com/watch?v=UEuW3xM_sIY 4. Evidence for benzene's structure and bonding https://www.youtube.com/watch?v=IMsS5RsGmW0 5. Reactions of benzene https://www.youtube.com/watch?v=Ph73widRSpw 6. Nitration of benzene https://www.youtube.com/watch?v=eILU43JqJDE
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						7. Friedel crafts reaction https://www.youtube.com/watch?v=K6SNxePSIKE

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
1B	1	Aromatic chemistry		3.3.10		
	2	Assessments				
	3	Amines	Amines are compounds based on ammonia where hydrogen atoms have been replaced by alkyl or aryl groups. This section includes their reactions as nucleophiles	3.3.11	<ol style="list-style-type: none"> 1. Introduction https://www.chemguide.co.uk/organicpro/amines/background.html#top 2. Preparation of amines https://www.chemguide.co.uk/organicpro/amines/preparation.html#top 3. Amines as bases https://www.chemguide.co.uk/organicpro/amines/base.html#top 4. Amines as nucleophiles https://www.chemguide.co.uk/organicpro/amines/nucleophile.html#top 5. Extra: amines and nitrous acid https://www.chemguide.co.uk/organicpro/ 	<p>Quiz https://app.carousel-learning.com/quiz/6eed919b-c6a0-4592-bb09-e2892a6f9f77</p> <p>Videos Amines https://www.youtube.com/watch?v=FO8Ddgci3Ys Azo dyes from aromatic amines https://www.youtube.com/watch?v=CFOj9yoMrQ Summary https://www.youtube.com/watch?v=kMDI4_0WedU (amides) https://www.youtube.com/watch?v=K5HGwCHNjRk</p>

					rops/amines/nitrousacid.html#top 6. Extra - phenylamine: https://www.chemguide.co.uk/organicpropr/anilinemenu.html#top	
4	Polymers	<p>The study of polymers is extended to include condensation polymers. The ways in which condensation polymers are formed are studied, together with their properties and typical uses. Problems associated with the reuse or disposal of both addition and condensation polymers are considered</p>	3.3.12	Condensation polymers https://www.chemguide.co.uk/14to16/organic/condpolymers.html	Quiz https://app.carousel-learning.com/quiz/833afa91-68d8-45ff-aae2-55864ee3150b Videos 1. Condensation polymers https://www.youtube.com/watch?v=od3S2eWMSmE 2. Condensation reactions https://www.youtube.com/watch?v=FLJEYL356-c 3. Polyesters https://www.youtube.com/watch?v=AD1p3_dNIOc 4. Hydrolysis of polyesters https://www.youtube.com/watch?v=DOhyJM8pGjk 5. Polyamides https://www.youtube.com/watch?v=DOhyJM8pGjk	

						com/watch?v=VUIOKBjBUAA 6. Hydrolysis of polyamides https://www.youtube.com/watch?v=kHt8ZJ556O8
5	Amino acids and DNA	Amino acids, proteins and DNA are the molecules of life. In this section, the structure and bonding in these molecules and the way they interact is studied. Drug action is also considered	3.3.13	1. Background https://www.chemguide.co.uk/organicprops/aminoacids/background.html#top 2. Acid-base behaviour of amino acids https://www.chemguide.co.uk/organicprops/aminoacids/acidbase.html#top 3. Protein structure https://www.chemguide.co.uk/organicprops/aminoacids/proteinstruct.html#top 4. Hydrolysis of proteins https://www.chemguide.co.uk/organicprops/aminoacids/proteinhydrolysis.html#top 5. Proteins as enzymes https://www.chemguide.co.uk/organicprops/aminoacids/enzymes.html#top	Videos 1. Introduction https://www.youtube.com/watch?v=IVUcazxo4FQ 2. Zwitterions https://www.youtube.com/watch?v=zL3PGlWAb5U 3. Reactions of amino acids https://www.youtube.com/watch?v=-jNlRCMoic 4. Condensation reactions https://www.youtube.com/watch?v=FLJEYL356-c 5. Proteins https://www.youtube.com/watch?v=1uGq0qKE3aM&list=PLcgmJlI16GiAIMIZUngr2z-3mbFBOW3hC&index=6&pp=iAQB 6. Protein structure https://www.youtube.com/watch?v=gTCS	

					<p>rops/aminoacids/enzymes.html#top</p> <p>6. Effect of changing conditions on enzyme catalysis https://www.chemguide.co.uk/organicpro/aminocids/enzymes2.html#top</p> <p>7. Enzyme inhibitors https://www.chemguide.co.uk/organicpro/aminocids/enzymes3.html#top</p> <p>8. DNA structure https://www.chemguide.co.uk/organicpro/aminocids/dna1.html#top</p> <p>9. Extra: DNA replication/protein synthesis https://www.chemguide.co.uk/organicpro/aminocids/dna2.html#top</p> <p>10. https://www.chemguide.co.uk/organicpro/aminocids/dna3.html#top</p> <p>11. https://www.chemguide.co.uk/organicpro/aminocids/dna4.html#top</p> <p>12. https://www.chemguide.co.uk/organicpro/aminocids/dna5.html#top</p>	<p>XPumt8s&list=PLcqmJlI16GiAlMIZUngr2z-3mbFBOW3hC&index=7&pp=iAQB</p> <p>7. Nucleotide structure https://www.youtube.com/watch?v=zEHLbvS_-eA&list=PLcqmJlI16GiAlMIZUngr2z-3mbFBOW3hC&index=14&pp=iAQB</p> <p>8. Drawing DNA/Cisplatin https://www.youtube.com/watch?v=D3mlRevWzc8</p>
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					rops/aminoacids/dna5.html#top 13. https://www.chemguide.co.uk/organicpropr/aminoacids/dna6.html#top	
	6	Amino acids and DNA		3.3.13		
	7					

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
2A	1	Electrochemical cells	<p>Redox reactions take place in electrochemical cells where electrons are transferred from the reducing agent to the oxidising agent indirectly via an external circuit. A potential difference is created that can drive an electric current to do work. Electrochemical cells have very important commercial applications as a portable supply of electricity to power electronic devices such as mobile phones, tablets and laptops. On a larger scale, they can provide energy to power a vehicle.</p>	3.1.11	<ol style="list-style-type: none"> 1. Electrode potential https://www.chemguide.co.uk/physical/redoxeqia/introduction.html#top 2. Electrochemical series https://www.chemguide.co.uk/physical/redoxeqia/ecs.html#top 3. Non-metals https://www.chemguide.co.uk/physical/redoxeqia/nonmetals.html#top 4. Combining half cells https://www.chemguide.co.uk/physical/redoxeqia/combinations.html#top 5. Predicting feasibility https://www.chemguide.co.uk/physical/redoxeqia/feasibility.html#top 	<p>Quiz https://app.carousel-learning.com/quiz/77221932-d069-4fd-d-96bb-f1d8b39e509e</p> <p>Videos</p> <ol style="list-style-type: none"> 1. Electrode potentials https://www.youtube.com/watch?v=Y7WRsaFJM8I 2. Standard hydrogen electrode https://www.youtube.com/watch?v=lp1K_jV262A 3. Electrochemical cells https://www.youtube.com/watch?v=jncyjigULRo 4. Summary https://www.youtube.com/watch?v=cS_SY4m45-w

					www.bbc.co.uk/physical/redoxeqia/predict.html#top	<ol style="list-style-type: none"> 5. Cells GCSE https://www.youtube.com/watch?v=8T4cEZD32qg 6. Fuel cells https://www.youtube.com/watch?v=sVF9pSB_STA 7. Advantages and disadvantages of fuel cells https://www.youtube.com/watch?v=8oL45kfadss 8. Storage cells https://www.youtube.com/watch?v=fUA9K6ldLQ 9. Redox titrations https://www.youtube.com/watch?v=Mv0o1sflM8&list=PLi6oabjl6coxbrrG7w2tD7l5lTjlq8atT&index=17&pp=iAQB 10. Redox titrations https://www.youtube.com/watch?v=wLgMnaGH1Yc&list=PLi6oabjl6coxbrrG7w2tD7l5lTjlq8atT&index=18&pp=iAQB 11. Thiosulfate titrations https://www.youtube.com/watch?v=ddHzpKdfF0c&list=PLi6oabjl6coxbrrG7w2tD7l5l
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						Tjlq8atT&index=20&pp=iAQB 12. Half equations https://www.youtube.com/watch?v=gENXsGxMCfl&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=14&pp=iAQB 13. Combining half equations https://www.youtube.com/watch?v=zjfxN-9tuQA&list=PLi6oabjl6coxbrrG7w2tD715lTjlq8atT&index=26&pp=iAQB
2	Electrochemical cells		3.1.11			
3	Practical					
4	Transition metals	<p>The 3d block contains 10 elements, all of which are metals. Unlike the metals in Groups 1 and 2, the transition metals Ti to Cu form coloured compounds and compounds where the transition metal exists in different oxidation states. Some of these metals are familiar as catalysts. The properties of these elements are studied in this section with opportunities for a wide range of practical investigations.</p>	3.2.5	1. Introduction https://www.chemguide.co.uk/inorganic/transition/features.html#top 2. Complex ions https://www.chemguide.co.uk/inorganic/complexions/whatis.html#top 3. Naming https://www.chemguide.co.uk/inorganic/complexions/names.html#top 4. Shapes https://www.chemguide.co.uk/inorganic	Quiz https://app.carousel-learning.com/quiz/2f05c869-dc58-4fda-b9c7-de49d4e68f28 Videos 1. Introduction https://www.youtube.com/watch?v=0xmOdgKzB1Q&list=PLi6oabjl6coxmdJCSAEjg4IE3ocM911Ag&index=1&pp=iAQB 2. General properties https://www.youtube.com/watch?v=m8OTnORw6og&list=PLi6oabjl6coxmdJCSAEjg	

					<p>/complexions/shape_s.html#top</p> <p>5. Ligand exchange https://www.chemguide.co.uk/inorganic/complexions/ligand_exch.html#top</p> <p>6. More ligand exchange https://www.chemguide.co.uk/inorganic/complexions/stabc_onst.html#top</p> <p>7. Colour https://www.chemguide.co.uk/inorganic/complexions/colour.html#top</p> <p>8. Vanadium https://www.chemguide.co.uk/inorganic/transition/vanadium.html#top</p> <p>9. Manganese https://www.chemguide.co.uk/inorganic/transition/manganese.html#top</p> <p>10. Iron https://www.chemguide.co.uk/inorganic/transition/iron.html#top</p> <p>11. Copper https://www.chemguide.co.uk/inorganic</p>	<p>4IE3ocM911Ag&index=2&pp=iAQB</p> <p>3. Precipitation reactions https://www.youtube.com/watch?v=VKsKxqGjkOU&list=PLi6oabjl6coxmdJCSAEjg4lE3ocM911Ag&index=3&pp=iAQB</p> <p>4. Complex ions https://www.youtube.com/watch?v=WqANuNfCc90&list=PLi6oabjl6coxmdJCSAEjg4lE3ocM911Ag&index=4&pp=iAQB</p> <p>5. Ligand substitution https://www.youtube.com/watch?v=LAnOtBr4VKU&list=PLi6oabjl6coxmdJCSAEjg4lE3ocM911Ag&index=6&pp=iAQB</p> <p>6. Stereoisomerism https://www.youtube.com/watch?v=jcBiPOOimlo&list=PLi6oabjl6coxmdJCSAEjg4lE3ocM911Ag&index=5&pp=iAQB</p>
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					/transition/copper.html#top 12. 13. Extra - chromium https://www.chemguide.co.uk/inorganic/transition/chromium.html#top 14. Extra cobalt https://www.chemguide.co.uk/inorganic/transition/cobalt.html#top	
	5	Transition metals		3.2.5		
	6	Transition metals		3.2.5		
	7	Transition metals		3.2.5		

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
2B	1	Transition metals		3.2.5		
	2	Assessments				
	3	Reactions of ions in aqueous solutions + practical	The reactions of transition metal ions in aqueous solution provide a practical opportunity for students to show and to understand how transition metal ions can be identified by	3.2.6	1. Acidity https://www.chemguide.co.uk/inorganic/complexions/acidity.html#top 2. Reactions with OH- https://www.chemguide.co.uk/inorganic/complexions/aquation.html#top	Videos 1. Precipitation reactions https://www.youtube.com/watch?v=VKsKxqGjkOU&list=PLi6oabjl6coxmdJCSAEjg4lE3ocM911Aq&index=3&pp=iAQB

			test-tube reactions in the laboratory.		<ol style="list-style-type: none"> 3. Reactions with ammonia https://www.chemguide.co.uk/inorganic/complexions/aquanh3.html#top 4. Reactions with carbonates https://www.chemguide.co.uk/inorganic/complexions/aquaco3.html#top 5. 	<ol style="list-style-type: none"> 2. Colours https://www.youtube.com/watch?v=HHpuxn0GZjc&list=PLi6oabjl6coxmdJCSAEjg4IE3ocM911Ag&index=8&pp=iAQB 3. Colours https://www.youtube.com/watch?v=XPI4M3akG_I&list=PLi6oabjl6coxmdJCSAEjg4IE3ocM911Ag&index=9&pp=iAQB 4. Reactions https://www.youtube.com/watch?v=AOj7C96q7dw&list=PLi6oabjl6coxmdJCSAEjg4IE3ocM911Ag&index=10&pp=iAQB
4	Period 3		The reactions of the Period 3 elements with oxygen are considered. The pH of the solutions formed when the oxides react with water illustrates further trends in properties across this period. Explanations of these reactions offer opportunities to develop an in-depth understanding of how and why these reactions occur.	3.2.4	<ol style="list-style-type: none"> 1. Physical properties https://www.chemguide.co.uk/inorganic/period3/elementsp_hys.html#top 2. Reactions https://www.chemguide.co.uk/inorganic/period3/elementsreact.html#top 3. Physical properties of oxides https://www.chemguide.co.uk/inorganic 	<p>Videos</p> <ol style="list-style-type: none"> 1. Physical properties https://www.youtube.com/watch?v=Mcl-W37hC_I 2. First ionisation energy https://www.youtube.com/watch?v=QaJY3hpDGjw 3. First ionisation energy https://www.youtube.com/watch?v=rM1CVh5nYLQ

					<p>/period3/oxidesphys.html#top</p> <p>4. Acid-base reactions of oxides https://www.chemguide.co.uk/inorganic/period3/oxidesh2o.html#top</p> <p>5. Extra - chlorides https://www.chemguide.co.uk/inorganic/period3/chlorides.html#top</p> <p>6. Extra - hydroxides https://www.chemguide.co.uk/inorganic/period3/hydroxides.html#top</p>	4.
5	NMR	Chemists use a variety of techniques to deduce the structure of compounds. In this section, nuclear magnetic resonance spectroscopy is added to mass spectrometry and infrared spectroscopy as an analytical technique. The emphasis is on the use of analytical data to solve problems rather than on spectroscopic theory	3.3.15	<p>1. Carbon 13 https://www.chemguide.co.uk/analysis/nmr/backgroundc13.html#top</p> <p>2. https://www.chemguide.co.uk/analysis/nmr/interpretc13.html#top</p> <p>3. Proton https://www.chemguide.co.uk/analysis/nmr/background.html#top</p> <p>4. https://www.chemguide.co.uk/analysis/nmr/lowres.html#top</p>	<p>Quiz https://app.carousel-learning.com/quiz/d9236741-688f-4875-a2b0-5467de0554ca</p> <p>Videos</p> <ol style="list-style-type: none"> 1. Introduction https://www.youtube.com/watch?v=EVyN5pZbzDA 2. Carbon 13 https://www.youtube.com/watch?v=IaHSYjDhGCM 3. Carbon 13 examples https://www.youtube.com/watch?v=YlCh9aK9ZVw 	

					<ol style="list-style-type: none"> 5. https://www.chemguide.co.uk/analysis/nmr/highres.html#top 6. https://www.chemguide.co.uk/analysis/nmr/integration.html#top 7. 	<ol style="list-style-type: none"> 4. Proton NMR https://www.youtube.com/watch?v=xZRA1Qh_QtM 5. Proton NMR 2 https://www.youtube.com/watch?v=yN-mPjLyf4I 6. Proton NMR 3 https://www.youtube.com/watch?v=9btbezNOI68 7. Proton NMR 4 https://www.youtube.com/watch?v=CtJc-NHX17s 8. Proton NMR 5 https://www.youtube.com/watch?v=IHgshjzun-8
6	NMR			3.3.15		
7	Chromotography + practical	Chromatography provides an important method of separating and identifying components in a mixture. Different types of chromatography are used depending on the composition of mixture to be separated		3.3.16	<ol style="list-style-type: none"> 1. Introduction https://www.chemguide.co.uk/analysis/chromatography/thinlayer.html#top 2. Column https://www.chemguide.co.uk/analysis/chromatography/column.html#top 3. Gas https://www.chemguide.co.uk/analysis/chromatography/gas.html#top 	Video <ol style="list-style-type: none"> 1. https://www.youtube.com/watch?v=mBz6U67g14Q 2. https://www.youtube.com/watch?v=kFiAci-pDRng

					4. HPLC https://www.chemguide.co.uk/analysis/chromatography/hplc.html#top 5. Paper https://www.chemguide.co.uk/analysis/chromatography/paper.html#top 6.	

Term	Week	Focus	Summary	Learning Outcomes	Reading	Videos/other
3A		Revision and exams				
		7405/1 Paper 1 Inorganic and Physical Chemistry 2h 10 June 2025 - morning				
		7405/2 Paper 2 Organic and Physical Chemistry 2h 16 June 2025 - morning				
		7405/3 Paper 3 2h 20 June 2025 - morning				