Arnewood Sixth

Sixth Form Summer Transition Work

Welcome to Arnewood Sixth! You are about to embark on a busy and important two years of sixth form study.

Sixth form life is very different. You are going to feel much more independent, empowered and responsible for your own learning. The expectation is that this journey is down to you. You need to commit and relish in the challenge of sixth form life; ambition, belief and commitment are essential for your success.

Below is a transition activity designed for you to complete over the late spring into summer in preparation for your chosen course. By completing the task, you will be better prepared for the start of your course. Your A level teachers will check the work in September. Your commitment starts now!

Subject	Chemistry	
Key Question	What are the skills and prior knowledge needed for success in Chemistry at A level and what careers and directions does it open up for me?	
Resource List	Chemistry specification	https://www.ocr.org.uk/qualifications/as-and-a-level/chemistry-a-h032-h432-from-2015/
	RSC chemistry careers	https://www.rsc.org/careers/
	Extra chemistry help	https://www.physicsandmathstutor.com

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Your Task	There are 4 parts to your transition work **Task 1 – Research** Research, reading and note making are essential skills for studying any A level. For the following links, read the articles and look up any key words which you are unfamiliar with, and bring a short summary of the key ideas from each article (MAX 100 words for each article) . **Task 2 – Ions and Compounds** Complete the tables to show the major ions that you need to know for A-level chemistry. Having this knowledge within your ability to recall will be important for your course. **Task 3 - Balancing Equations** A fundamental and important skill within A-level Chemistry. Below is practice on balancing the equations – if you need help try this video https://www.youtube.com/watch?v=vxCyzR6uETs **Task 4 - Basic Quantative Chemistry** Calculations are key part to A-level Chemistry and need practice. Below is some calculations in preparation for A-level chemistry. Please complete and bring with you for the start of the course. https://www.youtube.com/channel/UCqbOeHaAUXw9Il7sBVG3_bw
Additional resources	

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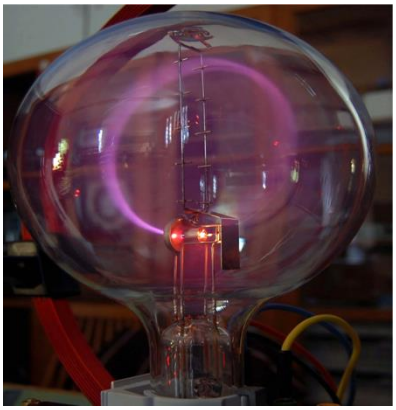
Summer Transition Work – Additional Resource

Task 1- Research

Research, reading and note making are essential skills for studying any A level. For the following links, read the articles and look up any key words which you are unfamiliar with, and bring a short summary of the key ideas from each article (MAX 100 words for each article) .



Article 1 - Models of the Atom

This article investigates the history of models of the atom and discovers how, a century ago, scientists were devising models of the atom in an attempt to explain the limited evidence they had about the fundamental structure of matter.

https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/38397-Catalyst_25_4_616.pdf

Article 2 – Microplastics and the ocean

This article looks at microplastics. Microplastics are tiny particles of polymer used in many products, they have been found to be an environmental pollutant especially in oceans.

https://www.stem.org.uk/system/files/elibrary-resources/2016/11/Catalyst27_1_microplastics_%20and_the_oceans.pdf

Article 3 - Diamond – more than just a gemstone

This article looks at diamond and graphite which are allotropes of carbon. Their properties which depend on the bonding between the carbon atoms are also examined.

https://www.stem.org.uk/system/files/elibrary-resources/2017/02/Diamond%20more%20than%20just%20a%20gemstone.pdf

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Task 2- Ions and Compounds

Complete the tables to show the major ions that you need to know for A-level chemistry. Having this knowledge within your ability to recall will be important for your course.

Positive Ions (Cations)		Negative Ion (Anions)	
Names	Formula	Names	Formula
Hydrogen	H^+	Chloride	
Lithium		Fluoride	F^-
Sodium		Bromide	
Potassium	K^+	Iodide	
Ammonium		Hydrogencarbonate	
Copper (I)	Cu^+	Hydroxide	
Silver		Nitrate	NO_3^{1-}
Calcium		Carbonate	
Magnesium		Oxide	O^{2-}
Barium	Ba^{2+}	Sulphide	
Copper (II)		Sulphate	
Aluminium		ethanoate	CH_3COO^-
Zinc		Phosphate	PO_4^{3-}
Lead	Pb^{2+}		
Iron (II)	Fe^{2+}		
Iron (III)			

Name of Substance	Formula of Compound	Name of Substance	Formula of Compound
Sodium Chloride		Sodium oxide	
Potassium Hydroxide		Barium sulphide	
Lithium Carbonate		Aluminium oxide	
Calcium Sulphate		Zinc carbonate	
Sodium hydrogen carbonate		Ammonium sulphate	
Magnesium chloride		Lithium phosphate	
Barium nitrate		Iron (II) hydroxide	
Strontium hydroxide		Iron (III) sulphate	
Silver nitrate		Magnesium ethanoate	
Ammonium nitrate		Calcium phosphate	

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Task 3 - Balancing Equations

A fundamental and important skill within A-level Chemistry. Below is practice on balancing the equations – if you need help try this video https://www.youtube.com/watch?v=vxCyzR6uETs

H_2	+	Cl_2	→	HCl						
Zn	+	O_2	→	ZnO						
Cl_2	+	Al	→	$AlCl_3$						
Na	+	O_2	→	Na_2O						
Mg	+	O_2	→	MgO						
Mg	+	HCl	→	$MgCl_2$	+	H_2				
Fe_2O_3	+	Al	→	Fe	+	Al_2O_3				
$CaCl_2$	+	KOH	→	$Ca(OH)_2$	+	KCl				
HCl	+	Na_2CO_3	→	NaCl	+	H_2O	+	CO_2		
HNO_3	+	NaOH	→	$NaNO_3$	+	H_2O				
HNO_3	+	$Ca(OH)_2$	→	$Ca(NO_3)_2$	+	H_2O				
H_2SO_4	+	KOH	→	K_2SO_4	+	H_2O				
		$NaNO_3$	→	$NaNO_2$	+	O2				
KI	+	$Pb(NO_3)_2$	→	KNO_3	+	PbI_2				
$CaCl_2$	+	Na_2SO_4	→	$CaSO_4$	+	NaCl				
HCl	+	K_2SO_3	→	KCl	+	H_2O	+	SO_2		
KOH	+	$MgSO_4$	→	$Mg(OH)_2$	+	K_2SO_4				
K	+	H_2O	→	KOH	+	H_2				
NaOH	+	H_3PO_4	→	Na_3PO_4	+	H_2O				
		$Pb(NO_3)_2$	→	PbO	+	NO_2	+	O_2		

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Task 4 - Basic Quantative Chemistry

Calculations are key part to A-level Chemistry and need practice. Below is some calculations in preparation for A-level chemistry. Please complete and bring with you for the start of the course.
https://www.youtube.com/channel/UCqbOeHaAUXw9ll7sBVG3_bw

Moles

Calculate the moles in:

1. 9.00 g of H_2O
2. 88.0 g of CO_2
3. 1.70 g of NH_3
4. 230 g of C_2H_5OH
5. 560 g of C_2H_4
6. 0.640 g of SO_2
7. 80.0 g of SO_3
8. 18.0 g of HBr

Calculate the mass of:

a. 2 moles of H_2O
b. 3 moles of CO_2
c. 2.8 moles of NH_3
d. 0.50 moles of C_2H_5OH
e. 1.2 moles of C_2H_4
f. 0.64 moles of SO_2
g. 3 moles of SO_3
h. 1 mole of HBr

Reacting Masses

What mass of barium sulphate would be produced from 10 g of barium chloride?

$BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$

What mass of potassium chloride would be produced from 20 g of potassium carbonate?

$K_2CO_3 + HCl \rightarrow KCl + H_2O + CO_2$

What masses of ethanol and ethanoic acid would need to be reacted together to give 1 g of ethyl ethanoate?

$C_2H_5OH + CH_3CO_2H \rightarrow CH_3CO_2C_2H_5 + H_2O$

Solutions

Calculate the number of moles of solute present in the following volumes.

25 cm^3 of 1.0 mol dm^{-3} HCl

50 cm^3 of 0.5 mol dm^{-3} HCl

250 cm^3 of 0.25 mol dm^{-3} HCl

500 cm^3 of 0.01 mol dm^{-3} HCl

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