Year 13 Redox Revision Helpsheet

Lesson Objectives	Tasks		
Know the IUPAC convention for writing half-equations for electrode reactions	Are half equations for electrode reactions written as reduction or oxidation processes?		Write a half equation for a silver electrode
Be able to use the conventional representation of cells	What does the vertical solid line in the shorthand for representing cells?	What does the double vertical solid line in the shorthand for representing cells?	Write the conventional representation of cells for an aluminium and copper cell
Understand how cells are used to measure electrode potentials by reference to the standard hydrogen electrode	Explain why a standard electrode is needed.	Draw and label a standard hydrogen electrode	Explain why a secondary standard electrode is sometimes used
Know the importance of the conditions when measuring the electrode potential, *E* Know that standard electrode potential, $E^{\ominus}$, refers to conditions of 298 K, 100 kPa and 1.00 mol dm-3 solution of ions.	What are the three standard conditions needed when measuring electrode potential?	With reference to equilibria, explain why these three conditions need to be kept constant.	
Know that standard electrode potentials can be listed as an electrochemical series	Explain what an electrochemical series is	Which is normally found at the top of an electrochemical series, the most negative or the most positive value?	Describe, for an electrochemical series written in the convential direction, how you can identify the most powerful oxidising agent and the most powerful reducing agent
Use $E^{\ominus}$ values to predict the direction of simple redox reactions calculate the e.m.f	Describe how you can use $E^{\ominus}$ values to predict the direction of simple redox reactions	Describe how you can use $E^{\ominus}$ values to calculate the e.m.f of a cell	

Lesson Objectives	Tasks		
Appreciate that electrochemical cells can be used as a commercial source of electrical energy	List three everyday uses of cells		Explain the difference between the scientific definition of battery and the everyday language use.
Appreciate that cells can be non-rechargeable (irreversible), rechargeable and fuel cells	Explain what a non-rechargeable battery is and give an example of one	Explain what a rechargeable battery is and give an example of one	Explain what a fuel cell is and give an example of one
Use given electrode data to deduce the reactions occurring in non-rechargeable and rechargeable cells and to deduce the e.m.f. of a cell	Explain how to use given electrode data to deduce the reactions occurring in non-rechargeable and rechargeable cells	Explain how to use given electrode data to deduce the e.m.f. of a cell	
Understand the electrode reactions of a hydrogen-oxygen fuel cell and appreciate that a fuel cell does not need to be electrically re-charged	Write out the electrode reactions of a hydrogen-oxygen fuel cell		Explain why a fuel cell does not need to be electrically re-charged
Appreciate the benefits and risks to society associated with the use of these cells	Describe the benefits and risks to society associated with the use of non-rechargeable cells	Describe the benefits and risks to society associated with the use of rechargeable cells	Describe the benefits and risks to society associated with the use of fuel cells
Be able to apply the electron transfer model of redox, including oxidation states and half equations to d block elements	Read p222-228 and give three examples of redox reactions involving transition metals. For all three examples write an ionic equation, work out the oxidation state of all species and identify the oxidising and reducing agents		