Map of the module: Agriculture and Industry

This shows the relationship between the Chemical Storylines, the Activities and the Chemical Ideas. To aid planning, laboratory-based practical work is indicated by (P), activities involving IT skills are indicated by (IT) and those developing study skills by (S).

Chemical Ideas references in *italics* are covered in earlier modules and are included in synoptic learning outcomes for this module in the specifications. Emphasis in teaching and learning should be on the **new** (non-italicised) sections of Chemical Ideas. The degree to which revisited Chemical Ideas are studied will depend on the needs of individual students.

ACTIVITIES		CHEMICAL STORYLINE	CHEMICAL IDEAS	
	AI1	WHAT DO WE WANT FROM AGRICULTURE?		
AI2.1 The nitrogen balance in UK agriculture	**AI2**	THE ORGANIC REVOLUTION	**9.1**	*Oxidation and reduction*
			11.3	The p block: N and Group 5
AI2.2 Investigating structure and bonding (P)			**2.4**	*Electronic structure: sub-shells and orbitals*
			3.1	*Chemical bonding*
			3.2	*The shapes of molecules*
AI2.3 Matching structure, bonding and properties			**5.8**	Bonding, structure and properties: a summary
AI3.1 Understanding equilibria	**AI3**	THE FERTILISER STORY	**7.1**	*Chemical equilibrium*
			7.2	Equilibria and concentrations
			10.5	*What is a catalyst?*
AI3.2 Finding the equilibrium constant for an esterification reaction (P)			**10.6**	*How do catalysts work?*
AI3.3 Finding the equilibrium constant for a redox reaction (P)			**10.2**	*The effect of temperature on rate*
			10.3	*The effect of concentration on rate*
AI3.4 Investigating the effect of pressure and temperature on equilibrium (teacher demonstration) (P)				
AI4 Vertellus Specialties UK at Seal Sands – an industrial chemistry case study	**AI4**	COMPETITION FOR FOOD	**15.2**	*Raw materials*
			15.3	*Costs and efficiency*
			15.5	*Health and safety*
			15.7	*Percentage yield and atom economy*
			15.10	*Green chemistry and recycling*
AI5 Check your knowledge and understanding	**AI5**	SUMMARY		

*As well as the above, synoptic learning outcomes for AI also state that students should be able to carry out a range of mass and volumetric calculations (**Chemical Ideas 1.1, 1.3, 1.4, 1.5**) and write and interpret balanced chemical equations (**Chemical Ideas 1.2**) including ionic equations (**Chemical Ideas 5.1**).