PLC for AS Chemistry for Term 2.			
3.1.3 Bonding			
Ionic bonding involves electrostatic attraction between oppositely charges ions in a lattice	RED	Amber	Green
Predict the charge on a simple ion using the position of the element in the periodic table	RED	Amber	Green
Construct formulas for ionic compounds (e.g sulfate, hydroxide, nitrate, carbonate and ammonium)	RED	Amber	Green
Single covalent bond contains a shared pair of electrons; multiple bonds contain multiple pairs of electrons; co-ordinate (dative covalent) bond shares a pair of electrons, both supplied by 1 atom	RED	Amber	Green
Represent a covalent bond using a line; co-ordinate bond using an arrow	RED	Amber	Green
Metallic bonding involves attraction between delocalised electrons and positive ions arranged in a lattice	RED	Amber	Green
The structures of: diamond, graphite, ice, iodine, magnesium and sodium chloride as examples of one of these 4 crystal structures: ionic, metallic, macromolecular, molecular	RED	Amber	Green
Relate the melting point and conductivity of materials to the type of structure and bonding present	RED	Amber	Green
Explain the energy changes associated with changes of state	RED	Amber	Green
Draw diagrams to represent these structures involving specified numbers of particles	RED	Amber	Green
Explain the shapes of, and bond angles in, simple molecules and ions with up to six electron pairs (including lone pairs) surrounding the central atom	RED	Amber	Green
Pairs of electrons as clouds that reel each other, arranging themselves as far apart as possible; with lone pair lone pair repulsion being greater than pair bond, pair bond repulsion	RED	Amber	Green
Define electronegativity	RED	Amber	Green
Use partial charges to show that a bond is polar	RED	Amber	Green
Explain why some molecules with polar bonds do not have a permanent dipole	RED	Amber	Green
Explain the existence of: permanent dipole-dipole forces; induced dipole-dipole (van der Waals, dispersion, London) forces; hydrogen bonding; between familiar and unfamilar molecules	RED	Amber	Green

Explain how melting and boiling points are influenced by these intermolecular forces	RED	Amber	Green
3.1.4 Energetics	RED	Amber	Green
Understand reactions can be exothermic or endothermic and that enthalpy change (ΔH) is the heat energy change measured under conditions of constant pressure	RED	Amber	Green
Understand the term standard conditions	RED	Amber	Green
Define standard entahlpy change of combustion ($\Delta_c H^\theta$) and standard enthalpy change of formation ($\Delta_f H^\theta$)	RED	Amber	Green
Use the equation q=mcΔT to calculate the molar enthalpy change for a reaction and in related calculations	RED	Amber	Green
REQUIRED PRACTICAL 2: Measurement of an enthalpy change	RED	Amber	Green
Use Hess's law to perform calculations, including calculation of enthalpy changes for reactions from enthalpies of combustion or from enthalpies of formation	RED	Amber	Green
Define the term mean bond enthalpy	RED	Amber	Green
Use mean bond enthalpies to calculate an approximate value of ΔH for reactions in the gaseous state	RED	Amber	Green
Explain why values from mean bond enthalpy calculations differ from those determined using Hess's law	RED	Amber	Green
3.1.5 Kinetics	RED	Amber	Green
Define the term activation energy	RED	Amber	Green
Explain why most collisions do not lead to a reaction	RED	Amber	Green
Draw and explain Maxwell-Boltzmann distribution curves for different temperatures	RED	Amber	Green
Define the term: rate of reaction	RED	Amber	Green
Use the Maxwell-Boltzmann distribution curve to explain why a small increase in temperature can lead to a large increase in rate	RED	Amber	Green
REQUIRED PRACTICAL 3: Investigation of how the rate of a reaction changes with temperature	RED	Amber	Green
Explain how a change in concentration or a change in pressure influences the rate of a reaction (collision frequency)	RED	Amber	Green

Define the term catalyst and explain how they work (activation energy; alternative pathway)	RED	Amber	Green
Use a Maxwell-Boltzmann distribution to help explain how a catalyst increases the rate of a reaction involving a gas	RED	Amber	Green
3.1.6 Chemical equilibria, Le Chatelier's principle and K_c	RED	Amber	Green
Explain what is happening in a reversible reaction at equilibrium	RED	Amber	Green
Use Le Chatelier's principle to predict qualitatively the effect of changes in temperature, pressure and concentration on the position of equilibrium (Catalysts do not affect it)	RED	Amber	Green
Explain why, for a reversible reaction used in an industrial process, a compromise temperature and pressure may be used	RED	Amber	Green
Construct an expression for Kc for a homogeneous system in equilibrium (using [X] for a species X of mol dm^{-3} concentration)	RED	Amber	Green
Calculate a value for Kc from the equilibrium concentrations for a homogeneous system at constant temperature	RED	Amber	Green
Perform calculations involving Kc	RED	Amber	Green
Predict the qualitative effects of changes of temperature on the value of Kc	RED	Amber	Green
3.1.7 Oxidation, reduction and redox equations	RED	Amber	Green
Understand the terms oxidation and reduction in terms of electrons	RED	Amber	Green
Work out the oxidation state of an element in a compound or ion from the formula	RED	Amber	Green
Write half equations identifying the oxidation and reduction processes in redox reactions	RED	Amber	Green
Combine half equations to give an overall redox equation	RED	Amber	Green