Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	13	**Sequence No.**		**Topic**	3.1.8 Thermodynamics

Retrieval	Core Knowledge	Student Thinking
What do teachers need to **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need to teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
A level 3.1.4: Energetics section, including Hess Cycles and Enthalpy changes.	**3.1.8.1 Born-Haber Cycles** Lattice enthalpy can be defined as either enthalpy of lattice dissociation or enthalpy of lattice formation. Born–Haber cycles are used to calculate lattice enthalpies using the following data: • enthalpy of formation • ionisation energy • enthalpy of atomisation • bond enthalpy • electron affinity. Students should be able to: • define each of the above terms and lattice enthalpy • construct Born–Haber cycles to calculate lattice enthalpies using these enthalpy changes • construct Born–Haber cycles to calculate one of the other enthalpy changes • compare lattice enthalpies from Born–Haber cycles with those from calculations based on a perfect ionic model to provide evidence for covalent character in ionic compounds. Cycles are used to calculate enthalpies of solution for ionic compounds from lattice enthalpies and enthalpies of hydration.	This unit explores archaic scientific knowledge and as such requires students to think about the journey of scientific knowledge through time.

	Students should be able to: • define the term enthalpy of hydration • perform calculations of an enthalpy change using these cycles. **3.1.8.2 Gibb Free-Energy Change** ΔH, whilst important, is not sufficient to explain feasible change. The concept of increasing disorder (entropy change, ΔS). ΔS accounts for the above deficiency, illustrated by physical changes and chemical changes. The balance between entropy and enthalpy determines the feasibility of a reaction given by the relationship: $\Delta G = \Delta H - T\Delta S$ (derivation not required). For a reaction to be feasible, the value of ΔG must be zero or negative. Students should be able to: • calculate entropy changes from absolute entropy values • use the relationship $\Delta G = \Delta H - T\Delta S$ to determine how ΔG varies with temperature • use the relationship $\Delta G = \Delta H - T\Delta S$ to determine the temperature at which a reaction becomes feasible.	