	KS4 Science: Energy Changes and Rates	I can do this	Covered in Class	Strength ?	Revised it?	**Kerboodle Textbook page reference**
Introduction to Energy Changes	• I can define Conservation of Energy, exothermic and endothermic reactions • I can identify an exothermic and endothermic reaction from a temperature change • I can evaluate uses of exothermic and endothermic reactions with examples.					112-113
Exo and endo - required practical - measuring temp. changes in reactions	• I can use scientific theories and explanations to develop a hypothesis • I can assess the risks in an experiment and identify suitable controls • I can draw a graph and interpret data from the graph					114-115
Reaction profiles	• I can draw simple reaction profiles for exothermic and endothermic reactions • I can use reaction profiles to identify reactions as exothermic or endothermic • I can explain exothermic and endothermic reactions in terms of bond making and breaking (HT)					116-117
Explaining energy changes (HT only)	• I can describe the energy changes in bond breaking and bond making • I can explain how a reaction is endothermic or exothermic overall • I can calculate the energy transferred in chemical reactions using bond energies					118-119
Introduction to rates and collision theory	• I can describe what is meant by the rate of a chemical reaction and recall the units for rate • I can explain what is required for a chemical reaction to occur in terms of collision theory • I can suggest ways in which the rate of reaction can be measured					128 - 129 130 - 131
Effect of concentration - required practical	• I can use scientific theories and explanations to develop a hypothesis • I can plan an experiment to test a hypothesis • I can evaluate methods and suggest possible improvements and further investigations					134-135
Effect of temperature	• I can predict the effect of temperature on the rate of reaction • I can explain the effect of temperature on the rate of reaction using collision theory • I can design an investigation for an unfamiliar reaction					132-133
Effect of surface area	• I can predict the effect of surface area on the rate of reaction • I can explain the effect of surface area on the rate of reaction using collision theory • I can compare solids with different surface areas quantitatively using surface area: volume ratio					130-131
Effect of catalysts	• I can predict the effect of a catalyst on the rate of reaction • I can explain the effect of a catalyst on the rate of reaction using collision theory and energy level diagrams • I can evaluate the use of catalysts in industry					136-137
Analysis of graphs	• I can explain what a graph shows in terms of the rate of reaction • I can draw tangents to curves and describe how this can be used to determine rate • I can calculate the gradient of a tangent to the curve to measure rate at a particular time (Higher tier only)					128-129