



<p>This half term: Skills, Knowledge and Understanding to be developed:</p> <ul style="list-style-type: none"> • Skills (students <u>WILL BE ABLE</u> to by the end of the Learning Programme): develop their practical skills through planning and carrying out experiments to study the effect of any relevant factor on the rate of a chemical reaction, using appropriate technology e.g. a light sensor and data logger; develop their ability to identify trends and patterns in data provided in tabulated and graph form; identify the uses of limestone in the production of iron and steel, in road-building, to neutralise soil acidity and to make cement; recall the chemical names for limestone, quicklime and slaked lime. • Knowledge (students <u>WILL KNOW</u> by the end of the Learning Programme): how changing temperature, concentration, particle size, or adding a catalyst affects the rate of a chemical change explain the effect using the particle theory; understand the reactions involving limestone and products made from it, including the exothermic reaction of quicklime with water and the reaction of limewater with carbon dioxide. • Understanding (students <u>WILL DEMONSTRATE THEIR UNDERSTANDING</u> by the end of the Learning Programme): answering a range of questions that focus around 'describe', 'explain', 'compare', 'analyse' and 'plan'. 		<p>Key Terms / Words: hard water, scum, lather, limescale, ion exchange, reaction rate, particle theory, activation energy, catalyst, enzyme, carbonate, tangent, quicklime, slaked lime, limestone</p>	
<p>LP 4 – Week 1 & 2 Learning Outcomes:</p> <p>1. Hard Water.</p> <ul style="list-style-type: none"> ○ Students will know the difference between temporary and permanent hard water. ○ Students will know the processes used to soften water to include boiling, adding sodium carbonate and ion exchange. ○ Students will know the advantages and disadvantages of different methods of water softening and the explanation of how these methods work. ○ Students will know the health benefits of hard water and its negative effects, e.g. on boiler elements. <p>2. Rates of reaction.</p> <ul style="list-style-type: none"> ○ Students will know what is meant by the term reaction rate and the factors which can affect the rate of a reaction. ○ Students will carry out practical methods used to determine the rate of reaction – gas collection and loss of mass to see the effect of particle size on the rate of reaction. ○ Students will carry out practical methods used to determine the rate of reaction – precipitation method to see the effect of temperature on the rate of reaction. ○ Students will carry out practical methods used to determine the rate of reaction – precipitation method to see the effect of concentration on the rate of reaction but using data-logging equipment. ○ Students will know how to apply the particle theory to explain how changes in surface area, concentration and temperature changes the rate of a reaction. 		<p>Success criteria:</p> <ul style="list-style-type: none"> ○ To be able to explain how to soften different types of hard water and explain the advantages and disadvantages of each method. ○ Explain the effect particle size has on rate of reaction by answering examination questions. ○ Carry out a practical to identify the effect of changing temperature on reaction rate 	<p>Homework LP 4 1/3 Complete a revision sheet on water</p>
<p>LP 4 – Week 3 & 4 Learning Outcomes: Students will apply and demonstrate new knowledge and skills in APP1 assessment.</p> <ul style="list-style-type: none"> ○ Students will know that catalysts are substances that increase the rate of a reaction while remaining chemically unchanged and that they work by lowering the energy required for a collision to be successful. ○ Students will apply the knowledge learnt to answer exam questions on rates. <p>3. Enzymes as biological catalysts</p> <ul style="list-style-type: none"> ○ Students will know that enzymes are biological catalysts which catalyse particular reactions under particular conditions. ○ Students will know the wide -ranging uses of enzymes. ○ Students will apply the knowledge learnt to answer exam questions on rate. ○ Students will be able to interpret and draw sketch graphs for rates of reaction experiments with varying conditions. <p>4. Metal carbonates</p>	<p>Assessment →</p> <p>APP1</p> <p>Mark</p>	<p>Success criteria: APP1</p> <ul style="list-style-type: none"> ○ Use the particle theory to complete QER question [6marks] on how the rate of a chemical reaction depends on concentration and temperature. ○ Carry out a simple practical to compare four different catalysts. ○ Students will be able to interpret graphs and sketch graphs expected with varying conditions. 	<p>Homework LP 4 2/3 Complete a revision sheet on reaction rates.</p>



<ul style="list-style-type: none">○ Students will identify the trend in stabilities of metal carbonates and their thermal decomposition to produce oxides and carbon dioxide.○ Students will be able to recall the chemical names for limestone, quicklime and slaked lime.		<ul style="list-style-type: none">○ Complete thermal decomposition practical task.○ Use results from practical tasks to identify reactivity of metal carbonates	
<p>LP 4 – Week 5 & 6 Learning Outcomes: Students will apply and demonstrate new knowledge and skills in a summative assessment during week 6 or 7.</p> <p>5. Cycle of limestone reactions</p> <ul style="list-style-type: none">○ Students will understand the reactions involving limestone and products made from it, including the exothermic reaction of quicklime with water and the reaction of limewater with carbon dioxide. <p>6. Uses of limestone</p> <ul style="list-style-type: none">○ Students will identify the uses of limestone in the production of iron and steel, in road-building, to neutralise soil acidity and to make cement. <p>7. Benefits and drawbacks of limestone quarrying</p> <ul style="list-style-type: none">○ Students will discuss the social, economic and environmental for or against quarrying limestone in a particular location, based on how the associated benefits/drawbacks affect themselves and other individuals/groups.	<p>Assessment →</p> <p>SA</p> <p>Mark</p> <p>Grade</p>	<p>Success criteria: SA</p> <ul style="list-style-type: none">○ Students should be able to describe the observations made during practical reactions of limestone.○ Explain the uses of limestone.○ Candidates should be able to give their own opinion and argue a case.	<p>Homework LP 4 3/3 Revise for the SA</p>