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|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit: <b>Rate of Chemical Change</b>       | <ol style="list-style-type: none"> <li>Calculating rate of reaction</li> <li>Factors that affect the rate of reaction</li> <li>Concentration and rate of reaction (required practical)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                     | <ol style="list-style-type: none"> <li>Collision theory and rate of reaction</li> <li>Catalysts</li> <li>Reversible reactions</li> </ol> | <ol style="list-style-type: none"> <li>Equilibrium</li> <li>The effect of changing conditions on equilibrium</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>LESSONS</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Knowledge &amp; Skills Development</b>  | <ul style="list-style-type: none"> <li>Calculate the mean rate of a reaction</li> <li>Draw, and interpret, graphs showing the quantity of product formed or quantity of reactant used up against time</li> <li>Draw tangents to the curves on these graphs and use the slope of the tangent as a measure of the rate of reaction</li> <li>Explain, using collision theory, how concentration, surface area, pressure and temperature affect the rate of chemical reactions</li> <li>Describe 2 different methods to investigate how concentration affects rate of reaction</li> </ul> |                                                                                                                                          | <ul style="list-style-type: none"> <li>Use simple ideas about proportionality when using collision theory to explain the effect of a factor on the rate of a reaction</li> <li>Explain catalytic action in terms of activation energy</li> <li>Use chemical equations to describe reversible reactions and describe them in terms of energy changes</li> <li>Interpret appropriate data to predict the effect of pressure, temperature and concentration changes on reactions at equilibrium</li> </ul> |
| <b>Assessment / Feedback Opportunities</b> | <b>Formative Assessment</b><br>Teacher questioning<br>Quizzes<br>Exam style questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                          | <b>Summative assessment</b><br>End of topic assessment<br>Exam questions in future end of topic assessments to assess recall                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Key Vocabulary</b>                      | Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest<br><br>Rate, Reaction, Reactant, Product, Temperature, Pressure, Concentration, Catalyst, Surface Area, Collision, Theory, Activation Energy, Equilibrium                                                                                                                                                                                                                       |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Literacy/Reading Opportunities</b>      | Subject specific vocabulary introduced before reading of related texts<br>Word etymology from Latin and Greek roots<br>Reading of simple and complex sentences, paragraphs, articles<br>Scientific writing including structuring methods, comparisons and evaluations                                                                                                                                                                                                                                                                                                                 |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Cross Curricular Themes</b>             | Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>Personal Development<br/>(Including British Values, RSE, Citizenship)</b> | None                                                           |
| <b>Career Opportunities</b>                                                  | Chemist, Pharmacist, Chemical Engineer, Fireworks manufacturer |