

# Chemistry 12

## Unit I: Reaction Kinetics Learning Log

The following table contains all the prescribed learning outcomes for the Kinetics unit of Chemistry 12. Use this table to help you stay organized and on track throughout the unit. Use it along with the Kinetics Study Guide to determine your level of competence and understanding of each learning outcome. Once you are confident that you completely understand each learning outcome, place a check mark in the square provided.

**Note: The Chemistry 12 Study Guides are based on OLD PLO's. Use the "Study Guide Equivalent" column to match up old PLO's to the new ones.**

Essential Learning Goals	Achievement Indicators	Practice	Evidence	Study Guide Equivalent	Status
<b>A1:</b> Demonstrate awareness that reactions occur at differing rates	Give examples of reactions proceeding at different rates	I.1 #1 – 6 I.2 #7 – 9	QUIZ #1	A1	<input type="checkbox"/>
	Recognize that rate is described in terms of some quantity per unit of time	I.3 #10 – 17 I.4 #18 – 19		A2	<input type="checkbox"/>
<b>A2:</b> Experimentally determine rate of a reaction	Identify properties that could be monitored in order to determine a reaction rate	Reaction Rates Worksheet	QUIZ #1	A4	<input type="checkbox"/>
	Recognize some of the factors that control reaction rates			A5	<input type="checkbox"/>
	Compare and contrast factors affecting the rates of both homogeneous and heterogeneous reactions			A6	<input type="checkbox"/>
	Describe situations in which the rate of reaction must be controlled			A7	<input type="checkbox"/>
	Calculate the rate of a reaction using experimental data			A3	<input type="checkbox"/>
<b>A3:</b> Demonstrate knowledge of collision theory  Identify the following principles as aspects of collision theory:	<ul style="list-style-type: none"> <li>- Reactions are the result of collisions between reactant particles</li> <li>- Not all collisions are successful</li> <li>- Sufficient kinetic energy (KE) and favourable geometry are required</li> <li>- To increase the rate of a reaction, one must increase the frequency of successful collisions</li> <li>- Energy changes are involved in reactions as bonds are broken and formed</li> <li>- A KE distribution curve can explain how changing temperature or adding a catalyst changes the rate</li> </ul>	I.5 #20 – 22  Reaction Rates Worksheet	QUIZ #1	B1	<input type="checkbox"/>

<b>A5:</b> Apply collision theory to explain how reaction rates can be changed	Use collision theory to explain the effect of the following factors on reaction rate: nature of reactants, concentration, temperature, surface area	I.5 #20 – 22 Reaction Rates Worksheet	QUIZ #1	B9	<input type="checkbox"/>
<b>A4:</b> Describe the energies associated with reactants becoming products	Describe the activated complex in terms of its potential energy, stability, and structure	I.6 #23 – 28	QUIZ #2	B2	<input type="checkbox"/>
	Define activation energy	I.7 #29 – 32		B3	<input type="checkbox"/>
	Correctly describe the relationship between activation energy and rate of reaction	I.8 #33 – 45		B4	<input type="checkbox"/>
	Describe the changes in PE and KE as reactant molecules approach each other	Reaction Kinetics Problem Set		B5	<input type="checkbox"/>
	Draw and label PE diagrams including $\Delta H$ , activation energy, and the energy of the activated complex			B6	<input type="checkbox"/>
	Relate the sign of $\Delta H$ to whether the reaction is exothermic or endothermic			B7	<input type="checkbox"/>
	Write chemical equations that describe energy effects as a chemical equation that includes the energy term and a chemical equation using $\Delta H$ notation			B8	<input type="checkbox"/>
<b>A6:</b> Analyse the reaction mechanism for a reacting system	Explain why most reactions involve more than one step	I.9 #46 – 53	QUIZ #2	C1	<input type="checkbox"/>
	Describe a reaction mechanism as the series of steps the result in the overall reaction and describe the role of the rate-determining step	I.10 # 54 – 55		C2	<input type="checkbox"/>
	Explain the significance and role of a catalyst	Reaction Mechanism Worksheet		C3	<input type="checkbox"/>
	Identify: reactant, product, reaction intermediate, activated complex, and catalyst from a given reaction mechanism			C5	<input type="checkbox"/>
<b>A7:</b> Represent graphically the energy changes associated with catalyzed and uncatalyzed reactions	Compare the PE diagrams for a catalyzed and uncatalyzed reaction in terms of: reactants, products, activated complex, reaction intermediates, reaction mechanism, $\Delta H$ , activation energy	I.11 + I.12 #56 – 61	QUIZ #2	C4	<input type="checkbox"/>
<b>A8:</b> Describe the uses of specific catalysts in a variety of situations	Identify platinum in automobile catalytic converters as a catalyst	I.13 #62 – 63		N/A	<input type="checkbox"/>
	Describe the effect of a catalyst on a number of reactions			C6	<input type="checkbox"/>