

PBL2 Rubric

	Level 4	Level 3	Level 2	Level 1	Level 0
Q1. (6 points)	(6 points)	(4.5 points)	(3 points)	(1.5 points)	(0 points)
<p>Problems 1- 3: Please briefly explain the chemical concepts and write the chemical reactions</p> <p>Problem 4: Based on your results, how much aspirin does one tablet from Mrs. Keat's bottle contain? Please show all the calculations.</p> <p>* Partial points may be given for each Level</p>	<p>Problems 1-3: Students show a clear and solid understanding of the concepts they are writing about. The chemical concepts are explained in students' own words.</p> <p>All the necessary chemical reactions are included.</p> <p>Problem 4: The calculations are present and are correct. There is consistency in sig figures across the calculations.</p>	<p>Problems 1-3: Students mostly show clear and solid understanding of the concepts but there are 1 or 2 minor errors</p> <p>OR</p> <p>There are 1-2 minor errors in the chemical reactions included</p> <p>Problem 4: The calculations are present and mostly correct. There are 1-2 minor errors present. The sig figures are mostly</p>	<p>Problems 1-3: Students show some understanding of the concepts but there are 2 major errors in the explanations provided.</p> <p>OR</p> <p>Chemical reaction equations are missing</p> <p>Problem 4: The calculations are present. There are up to 2 major errors in the calculations.</p> <p>OR</p>	<p>Problems 1-3: Students show minimum understanding of the concepts and some of the chemical reaction equations are missing</p> <p>Problem 4: The calculations are present, but there are up to 3 major errors in the calculations and minor inconsistency in sig figs.</p> <p>OR</p>	<p>Problems 1-3: There are multiple errors in explanations and chemical reaction equations provided.</p> <p>OR</p> <p>The explanations and the equations are generated by AI</p> <p>Problem 4: The calculations are present but there are multiple major errors in the calculations (>3) and sig figs.</p> <p>OR</p>

		consistent across the calculations.	There is a significant inconsistency in sig figures and 1-2 minor errors in the calculations	There are multiple errors in sig figures and 2 major errors in the calculations.	The calculations are not present
Q2a). Justification (4 points) Did your experiment work or not? Justify your answer based on your experimental evidence/observations. Please refer to your PBL1 report evidence section, Question 5. <i>* Partial points may be given for each Level</i>	(4 points) The justification is provided, valid and based on the evidence and the experimental observations collected through the lab.	(3 points) The justification is provided, mostly valid and mostly based on the evidence and the experimental observations collected through the lab.	(2 points) The justification is provided, mostly valid, but there are only a few references to the experimental evidence/observations.	(1 point) The justification is provided, but it is mostly invalid, and there is no reference to evidence and the experimental observations collected through the lab.	(0 points) The justification is completely invalid.
Q2b). Analysis (4 points)	(4 points)	(3 points)	(2 points)	(1 point)	(0 points)

<ul style="list-style-type: none"> • If your experiment worked, please provide ideas on how the procedure can be improved for the future use • If your experiment did not work, please provide reasons as to why you think it did not work and what should have been done differently. 	<p>If the experiment worked: The ideas/suggestions on how to improve the procedure for future use are provided. The suggestions are valid and relevant.</p> <p>If the experiment did not work: The reasons why the experiment did not work and suggestions about what should have been done differently are provided. Both the reasons and suggestions are valid and relevant.</p>	<p>If the experiment worked: The ideas/suggestions on how to improve the procedure for future use are provided. The suggestions are mostly valid and mostly relevant.</p> <p>If the experiment did not work: Both the reasons and suggestions are mostly valid and mostly relevant. There are up to two minor errors in reasoning</p> <p>OR The reasons are valid and relevant,</p>	<p>If the experiment worked: The ideas/suggestions on how to improve the procedure for future use are provided. The suggestions are somewhat valid and mostly relevant.</p> <p>If the experiment did not work: Both the reasons and suggestions are somewhat valid and mostly relevant. There is one major error in reasoning</p> <p>OR</p>	<p>If the experiment worked: The ideas/suggestions on how to improve the procedure for future use are provided. The suggestions are somewhat valid and somewhat relevant.</p> <p>If the experiment did not work: Both the reasons and suggestions are somewhat valid and somewhat relevant. There are two major errors in reasoning</p>	<p>If the experiment worked: The ideas/suggestions on how to improve the procedure for future use are not valid and not relevant.</p> <p>If the experiment did not work: Both the reasons and suggestions are invalid and irrelevant</p>
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* Partial points may be given for each Level		but suggestions are mostly valid and reasonable or vice versa	The reasons are mostly valid and relevant, but suggestions are somewhat valid and reasonable or vice versa		
Q3. (6 points) Problems 1-3: Write a recommendation/ letter to the contractor/instruc tion to future campers	(6 points) Problems 1-3: The recommendation/let ter to the contractor/instructio n is included, it is clear and relevant. It is written in students' own words, and the sentence count is respected.	(4.5 points) Problems 1-3: The recommendation/ letter to the contractor/instruc tion is included, it is mostly clear and mostly relevant. It is written in students' own words, and the sentence count is respected.	(3 points) Problems 1-3: The recommendation/ letter to the contractor/instruc tion is included, it is mostly clear and somewhat relevant. OR The recommendation/ letter to the contractor/instruc tion is included, it is mostly clear and mostly relevant.	(1.5 points) Problems 1-3: The recommendation/ letter to the contractor/instruc tion is included, it is somewhat clear and somewhat relevant.	(0 points) Problems 1-3: The recommendation/ letter to the contractor/instruc tion is completely unclear and not relevant. OR It is generated by AI

<p>Problem 4:</p> <p>Was the amount of aspirin that Mrs. Keats took over 4-5 days sufficient to cause chronic overdose? Please show your calculations and write a short report (10-15 sentences) to justify your answer based on the information you were provided and your experimental results.</p>	<p>Problem 4</p> <p>The answer and the justification are provided, and they are clear and valid.</p> <p>Additional requirements: The answer and the justification are</p> <ul style="list-style-type: none"> - Based on experimental results/calculations - Based on the information about chronic overdose - Accompanied by calculations 	<p>Problem 4</p> <p>The answer and the justification are provided, and they are mostly clear and mostly valid, but one of the additional requirements from Level 4 is missing</p>	<p>It is written in students' own words, but it greatly exceeds the sentence count limit.</p> <p>Problem 4</p> <p>The answer and the justification are provided, and they are mostly clear and mostly valid, but two of the additional requirements are missing</p> <p>OR</p> <p>The answer and the justification are provided, and they are somewhat clear and mostly valid.</p> <p>OR</p>	<p>Problem 4</p> <p>The answer and the justification are provided, and they are mostly clear and mostly valid, but three of the additional requirements from Level 4 are missing.</p> <p>OR</p> <p>The answer and the justification are provided, and they are somewhat clear and somewhat valid.</p>	<p>Problem 4</p> <p>The answer and the justification are provided, but they are completely unclear and invalid</p>
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<p>* Partial points may be given for each Level</p>	<ul style="list-style-type: none"> - Calculations are correct - Sig figures are consistent across calculations 		<p>The sentence limit greatly (>30) exceeds the required count of 10-15 sentences.</p>		
<p>Data Sheet (10 points)</p>	<p>(10 points)</p> <p>The Data Sheet is prepared by the student and well customized to the experiment and contains all the necessary data (such as weights of the starting materials and all the measured volumes) and evidence. All the observations are included and detailed. The significant figures are reported properly</p>	<p>(8 points)</p> <p>The Data Sheet is customized to the experiment and contains most of the necessary data (10-15% of the data might be missing). The observations are included and mostly detailed.</p> <p>The significant figures are reported properly.</p>	<p>(6 points)</p> <p>The Data Sheet is not customized to the experiment OR the Data Sheet was provided by the lab instructor OR</p> <p>The Data Sheet is customized to the experiment, but it is missing some necessary data (up to 30-40% of the data might be missing). The observations are included and mostly detailed.</p>	<p>(4 points)</p> <p>The Data Sheet is not customized to the experiment. A lot of necessary data is missing (>50%). The observations are included but lack a lot of details. The sig figs are mostly correct.</p>	<p>(0 points)</p> <p>The Data Sheet is not customized, and it is missing a lot of data and observations are not included. The significant figures are reported incorrectly.</p>

			The significant figures are reported properly.		
Total # points:	30 points				