

Name: _____

Date: _____

Activity: Measuring Reaction Rates

Learning Objective

To investigate reaction rates

Materials

Approximately 60 tokens (count first!)

Plastic cup

Graph Paper

Procedure

1. Ensure there is a dot or an "x" on one side of all of the tokens.
2. Place all tokens in the cup, put on the lid and shake. These tokens are the reactant molecules.
3. Open the lid and pour out all of the tokens. Record the number of tokens that are still reactants (landed "X" side down) and the number that are products (landed "X" side up). Don't flip any over. Record these numbers in the data tables.
4. Return all unreacted tokens (blank ones) to the cup and repeat until there are fewer than three "unreacted" tokens. Do not keep going, even if you don't fill in the whole chart. Each shake represents "one minute" of reaction time.
5. Repeat the procedure two more times.

Data

Time (min)	Number of Remaining Reactant Tokens	Change in Number of Reactant Tokens (Δ Tokens/min)	Total Number of Product Tokens Produced	Change in Number of Product Tokens (Δ Tokens/min)
0			0	
1				
2				
3				
4				
5				
6				

Time (min)	Number of Remaining Reactant Tokens	Change in Number of Reactant Tokens (Δ Tokens/min)	<u>Total</u> Number of Product Tokens Produced	Change in Number of Product Tokens (Δ Tokens/min)
0			0	
1				
2				
3				
4				
5				
6				

Time (min)	Number of Remaining Reactant Tokens	Change in Number of Reactant Tokens (Δ Tokens/min)	<u>Total</u> Number of Product Tokens Produced	Change in Number of Product Tokens (Δ Tokens/min)
0			0	
1				
2				
3				
4				
5				
6				

Discussion

1. Make a graph that shows the number of reactant and product tokens over time. Plot each trial in a separate colour, but put them all in the same graph. Print your graph.
2. What happens to the rate of a reaction over time? Explain why this is happening. Use specific evidence from your data.
3. What is the instantaneous rate of reaction of the reactants at 2.5 minutes for each trial? Draw the tangent lines on your graph.
4. What is the average rate of reaction of the products from 0 to 3 minutes for each trial? Draw the line that represents this on your graph.