



## Toothpickase: An Introduction to Enzyme Kinetics

**Table 1. Toothpickase Activity Part A**

Interval Time (sec)	Cumulative time (sec)	# TPs Broken	Total Broken
10	10		
20	30		
30	60		
60	120		

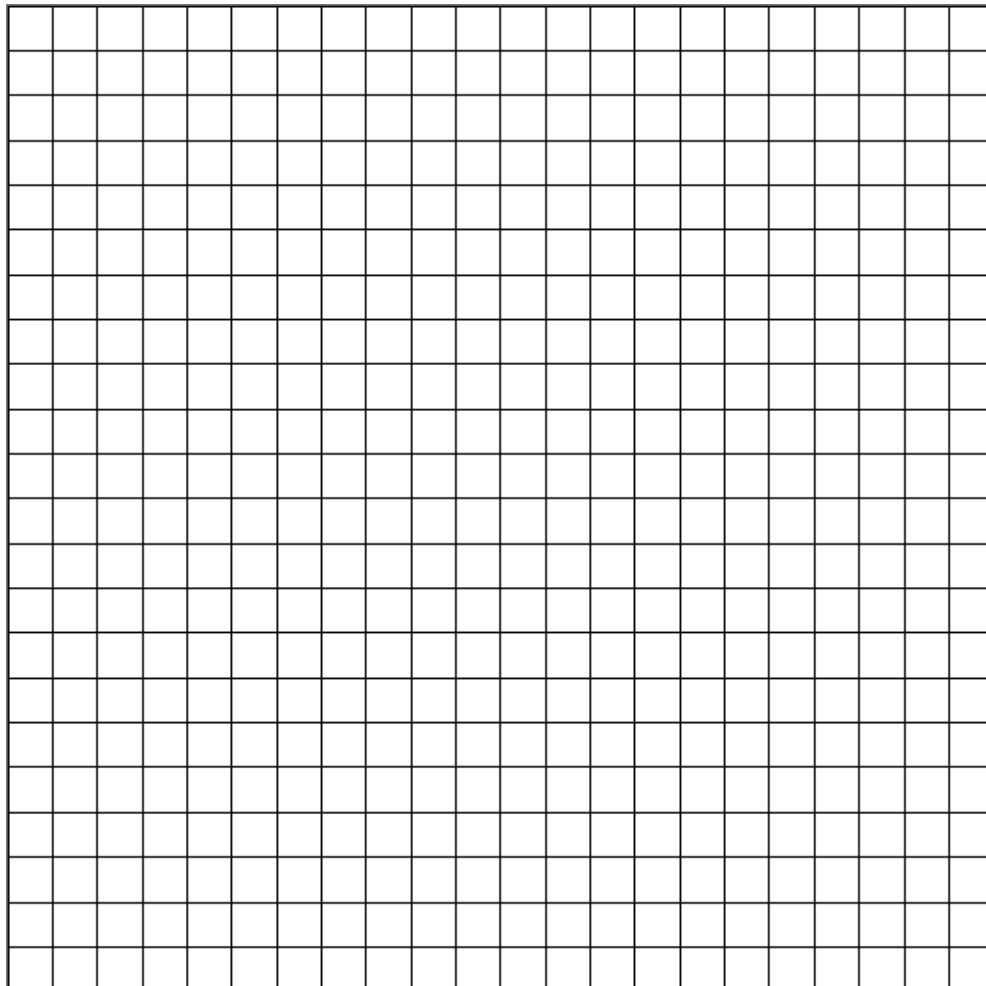
**Table 2. Toothpickase Activity Part B  
 (Decreased Toothpick Concentration)**

Interval Time (sec)	Cumulative time (sec)	# TPs Broken	Total Broken
10	10		
20	30		
30	60		
60	120		

**Table 3. Toothpickase Activity Part C  
 (Increased Enzyme Concentration)**

Interval Time (sec)	Cumulative time (sec)	# TPs Broken	Total Broken
10	10		
20	30		
30	60		
60	120		

Graph the number of toothpicks broken (total) over time (cumulative). **\*\*Use the shaded data.\*\*** Put all 3 sets of data on the same graph and include a key to distinguish them.



## Answer with complete sentences.

1. What happened to the reaction rate as the supply of the unbroken toothpicks diminishes? Why did this happen?
2. What do you think would happen to the reaction rate if there were 2,000 toothpicks to begin with? (think about the rate of the toothpickase: does it have a limited rate or can it keep getting faster and faster)
3. What happened to the reaction rate when there were 2 toothpickase enzymes working? Why did this happen?
4. What happened to the reaction rate when the toothpicks were all spread out? Why did this happen?
5. What do you think would happen to the reaction rate if the enzymes could separate the products and reactants? Why?
6. What do you think would happen to the reaction rate if plastic toothpicks were mixed in with the wooden toothpicks? Why?
7. What do you think would happen to the reaction rate if toothpickase was put in ice before interacting with the toothpicks? Why?