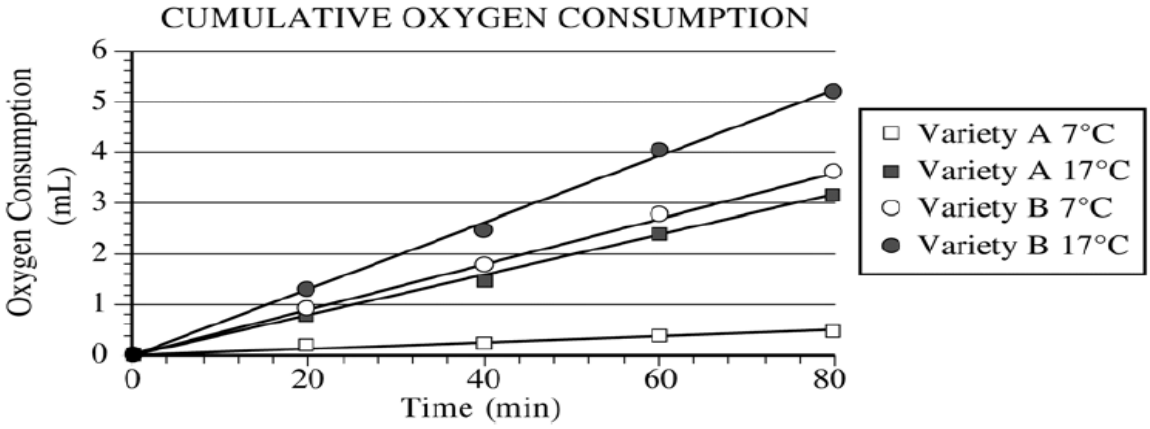
Metabolism & Enzymes Review Question

A microbiologist was studying two different varieties of yeast. The yeast was put into tubes, with sufficient amounts of oxygen, glucose, and water. Samples were kept at two different temperatures. The consumption of oxygen was measured over time, and graphed.



1. Explain the relationship between metabolism and oxygen consumption.
2. Discuss the effects of temperature on the rates of metabolism.
3. In a second experiment, variety A yeast at both temperatures was treated with a chemical that prevents NADH from being oxidized to NAD+. **Predict** the most likely effect of the chemical on metabolism and oxygen consumption of the treated yeast. **Explain** your prediction.

Biochemistry and Enzymes Review Question

An experiment was conducted to measure the reaction rate of the human salivary enzyme α-amylase. Ten mL of a concentrated starch solution and 1.0 mL of α-amylase solution were placed in a test tube. The test tube was inverted several times to mix the solution and then incubated at 25°C. The amount of product (maltose) present was measured every 10 minutes for an hour. The results are given in the table to the right.

Time (minutes)	Maltose Concentration (μM)
0	0
10	5.1
20	8.6
30	10.4
40	11.1
50	11.2
60	11.5

1. Graph the data, making sure to provide labelled axes, and a title.
2. Why was there a change in reaction rate after 30 minutes.
3. If the amount of α-amylase was doubled, what would the graph look like? Draw this line on your graph and EXPLAIN the difference in shape.
4. Explain why the a-amylase graph would look different if the amount of maltose was kept constant and the temperature changed (from 0°C to 70°C)