

Respiration of Yeast

Background Information:

Organisms such as yeast have the ability to break down food molecules (glucose) and synthesize ATP without the use of oxygen (anaerobic respiration). When the appropriate food is available, yeast can carry out alcoholic fermentation, a type of anaerobic respiration, producing CO₂. Thus, the production of CO₂ can be used to measure the rate of alcoholic fermentation.

Procedure:

1. Use the plastic pipette to draw up enough yeast and apple juice mixture to fill the tube of the pipette.
2. Gently turn the pipette upside down so that the mixture moves into the bulb of the pipette. Place weights on pipette.
3. Fill test tube with room temperature water and add pipette, still upside down. The water level should be higher than the tip of the pipette.
4. Wait two minutes before you take any readings. Then, count the number of bubbles produced in a 5 minute period.
5. Trial 2: Repeat steps 1-4 but use ice water for step 3.
6. Trial 3: Repeat steps 1-4 but use warm water for step 3.
7. Calculate the number of bubbles produced per minute in the three trials.

Data:

Table 1: Group Data

Trial	Number of Bubbles	Number of minutes	Bubbles / minute (bpm)
1 (medium temp)			
2 (cold temp)			
3 (warm temp)			

Table 2: Class Data

Group	Trial 2 - Cold bpm	Trial 1 - Medium bpm	Trial 3 - Warm bpm
1			
2			
3			
4			
5			
6			
7			
8			

Qualitative Data: Record observations you made while conducting this experiment.

Questions:

1. What is the independent variable in this experiment?
2. What is the dependent variable in this experiment?
3. Create a graph (on a separate sheet) to summarize the class data set. Staple your graph to this paper when you turn your assignment in.
4. What type of figure (graph) would be most appropriate for the data? Explain why.
5. What factors were controlled in this experiment? How were they controlled?
6. Knowing that enzymes are important in all chemical processes including cellular respiration what do you think would happen to the rate of respiration if we used boiling water in a fourth trial?
7. What gas is in the bubbles produced by the yeast?
8. Predict what would happen to the rate of bubbles per minute if more yeast were used in the mixture.
9. What is the significance of the varying number of bubbles per minute in this experiment?
10. What conclusion have you formed after performing this experiment? Explain!!