PRELIMINARY ACTIVITY FOR

Sugar Fermentation by Yeast

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Yeast can metabolize sugar in two ways, *aerobically,* with the aid of oxygen, or *anaerobically,* without oxygen. When yeast metabolizes a sugar under anaerobic conditions, ethanol (CH_3CH_2OH) and carbon dioxide (CO_2) gas are produced. An equation for the fermentation of the simple sugar glucose ($C_6H_{12}O_6$) is:

$$C_6H_{12}O_6 \longrightarrow 2\ CH_3CH_2OH + 2\ CO_2 + \text{energy}$$

The metabolic activity of yeast can be determined by the measurement of gas pressure inside the fermentation vessel.

In the Preliminary Activity, you will use a Gas Pressure Sensor to monitor the pressure inside a test tube as yeast metabolizes glucose anaerobically. When data collection is complete, you will perform a linear fit on the resultant graph to determine the fermentation rate.

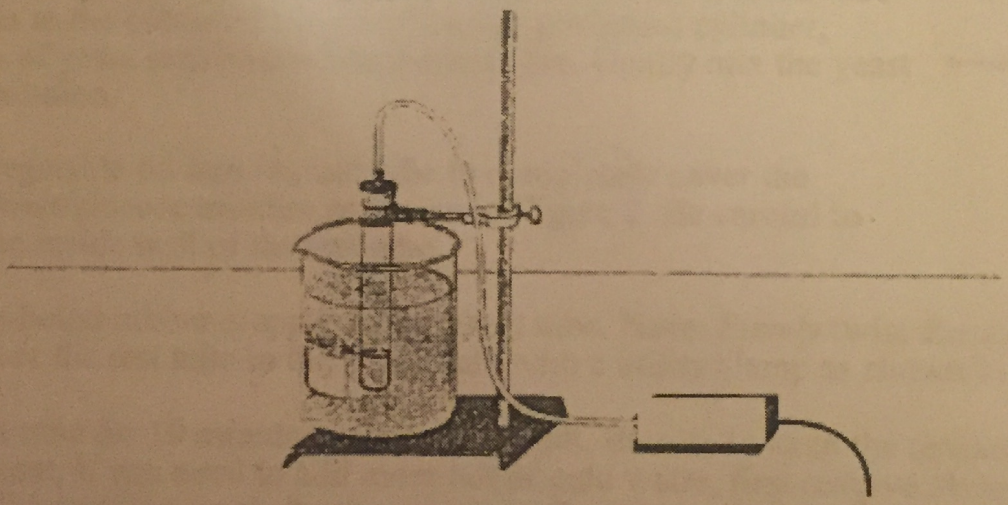

Figure 1

After completing the Preliminary Activity, you will first use reference sources to find out more about sugar fermentation by yeast before you choose and investigate a researchable question dealing with fermentation. Some topics to consider in your reference search are:

- sugars
- glucose
- fermentation
- anaerobic respiration
- aerobic respiration
- yeast
- enzyme
- substrate
- enzyme inhibitor