

The Power of Yeast Challenge

What Is *IT!*

What causes the balloons to inflate?

Understanding the phenomenon: Yeast converts sugar into energy needed for growth and reproduction during the process of cellular respiration. The by-product of this process is carbon dioxide (CO₂) and water (H₂O). As the yeast reproduces, more and more oxygen gets used up. When the amount of oxygen is depleted, the ability of yeast to completely convert sugar into carbon dioxide and water stops. Yeast continues to need energy. In the absence of oxygen, the yeast converts the sugar into CO₂ and ethanol (ethyl alcohol) in a process known as anaerobic respiration.

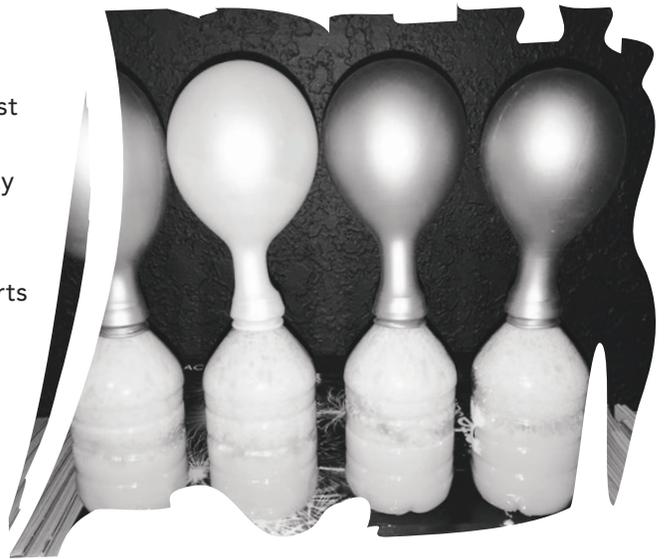
Think About *IT!*

Why did the balloons inflate? Yeast begins to grow and reproduce. As it does, it converts sugar in the water into energy during the process of cellular respiration. The by-product of this process is carbon dioxide (CO₂) and water (H₂O). The CO₂ gas causes the balloons to inflate.

Extend *IT!*

What questions do you have? Think of the possible variables that could be manipulated to get different results. Things that could change: the type of yeast, the type of sugar, the size of the balloons, the amount of ingredients (water, sugar, yeast), and the temperature.

- Did the mass of the balloons change during the process of cellular respiration?
- Does the amount of sugar used make a difference in the amount of gas produced?
- Does temperature affect the amount of carbon dioxide produced?



Materials List:

- Small Water Bottles
- Warm Water
- Yeast Packets
- Sugar
- Medium-Sized Balloons

Dare to Change *IT!*

How can your knowledge of yeast and cellular respiration help make a difference in your school and community?

Scenario: The Golden State Bread Company is having a contest to create a recipe for the lightest, fluffiest bread. The prize is free bread for a year to your favorite charity. You and a group of your friends want to enter the contest and donate the winnings to a local food bank.

Challenge: Determine the best combination of yeast and sugar to meet the criteria of creating the fluffiest and lightest bread.

Suggested Resources and Articles:

Yeast: Making Great Food for 5,000 years. But, what exactly is it?

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