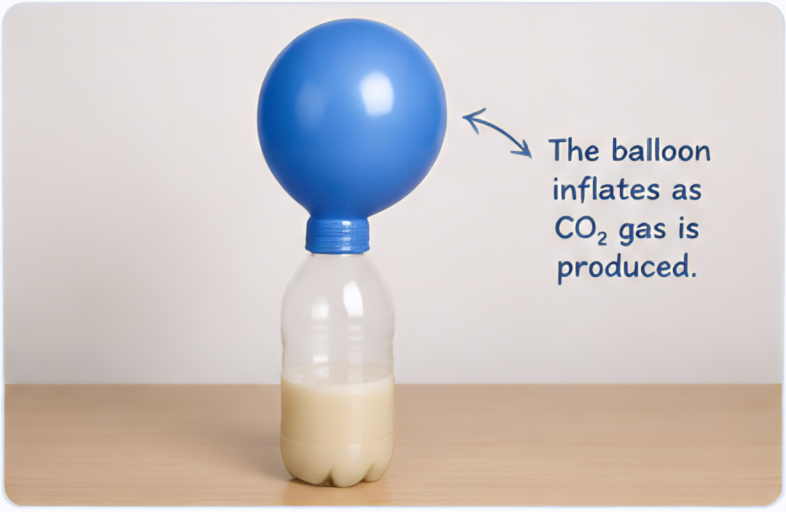
SCIENCE EXPERIMENT

Growing Yeast and Observing CO_2 Production in a Balloon

In this experiment, you will grow yeast in a sugar solution and observe the carbon dioxide (CO_2) it produces by inflating a balloon.

MATERIALS

- 1 packet (2 1/4 tsp) active dry yeast
- 1/4 cup sugar
- 2 cups warm water (100–110°F / 38–43°C)
- 1 clear plastic bottle (16–20 oz)
- 1 balloon
- 1 measuring cup
- 1 funnel (optional)
- Tape (optional)
- Marker
- Thermometer (optional)



PROCEDURE

1. In the bottle, add warm water (about 2 cups).
2. Add sugar and stir until dissolved.
3. Add the yeast. Do not stir.
4. Quickly stretch the balloon over the mouth of the bottle to create a seal.
5. Place the bottle in a warm place (75–85°F / 24–29°C).
6. Observe the balloon over the next 30–60 minutes.
7. Record your observations in the data table.
8. When finished, carefully remove the balloon and discard the mixture.

DATA TABLE

Record your observations.

Time (minutes)	Balloon Size (circumference or description)	Other Observations (foam, bubbles, smell, etc.)
0		
10		
20		
30		
40		
50		
60		

SAFETY

- Do not drink the yeast mixture.
- Keep the bottle upright to prevent spills.

WHAT'S HAPPENING?

Yeast is a living organism (a fungus) that eats sugar. As it breaks down the sugar, it produces carbon dioxide (CO_2) gas and ethanol. The CO_2 gas fills the balloon, causing it to inflate.

ANALYSIS QUESTIONS

1. What changes did you observe over time?

   _____

2. What gas caused the balloon to inflate?

   _____

3. What do you think would happen if the water was too hot? Too cold?

   _____

4. How could you change this experiment to test a different variable?

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EXPERIMENT TIPS

Yeast works best in warm (not hot) water. Temperature that is too hot can kill yeast.
Be patient—the balloon may take 10–20 minutes to start inflating.