CO2 Sensor

# Meet the Yeast Beast

**Grades:** 4 & Up
**Time:** 30 Minutes
**Subject:** Life Science, Biochemistry
**Topics:** Fermentation, Yeast, and CO2.

## Meet Yeast

Yeast is single-celled microorganism that is a member of the Fungi kingdom. Yeast has a big appetite and when it consumes sugar it produces CO2 and alcohol as byproducts of a process called fermentation.

You have been hired as a biochemist and charged with the task of generating CO2 from fermentation in the greatest quantities possible. Using science and data, you must determine the optimum amount of sugar to feed your yeast beast.

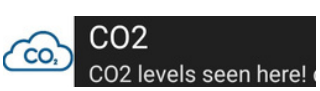
**Important:** When the yeast is cold or dry it will be inactive and the microorganism will be resting. But when it dissolves in water/milk it comes to life! The movement of yeast will not be visible as it is a microscopic fungus organism but it is there!

## How Does this Work?

Fermentation often happens through the work of tiny living things (microorganisms) like yeasts and bacteria. These living things create substances called enzymes. The enzymes break down food into chemicals (Breaking sugar down into CO2 and alcohol).

## What You Will Need/Prep

- databot™ 2.0 & Vizeey™
- IOS/Android Smart Device
- Read the Vizeey™ Fast Start Guide and install Vizeey™ if you haven't already.
- Use Vizeey™ to scan this QR code and get started with CO2 experiment.




## Important Terms

Fermentation: The chemical breakdown of a substance by bacteria, yeasts, or other microorganisms.

Yeast: A single-celled microorganism that is a member of the Fungi kingdom.

## PDQ: Feed the Yeast Beast!

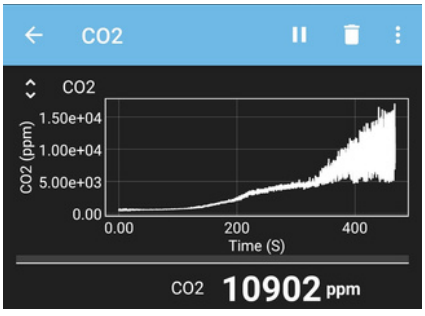
As a biochemist you will experiment on yeast beasts by measuring CO2 output and correlating it to the amount of sugar you feed the beasts. Your task is to maximize CO2 output through fermentation. Determine the perfect sugar : yeast ratio for scaling!

1. Add life to the yeast by filling the small bowl with 1/2 cup water at 110° F (43° C) and adding yeast into it. Make sure the yeast (1 teaspoon) is completely dissolved into the water before going to the next step.
2. Give food to the yeast by adding 1/2 teaspoon of sugar into the mixture. Swirl the bowl around to make the sugar dissolve into the mixture.
3. Turn on databot™ and load Vizeey™, then tap on CO2 in Vizeey™ to load the experiment & use these icons to start and pause the experiment:
4. Place databot™ in a container along with the open bowl of mixture and seal the container to eliminate ventilation as shown.
5. Use the start icon to start and watch the data! You can see the gradual increase in CO2 levels. Once you reach a plateau, note the highest CO2 level and amount of sugar. Repeat these steps for 1 tsp, 1.5 tsp, and more if you have time.
6. What is the best mixture for maximum CO2 output - this will be your biochemist recommended ratio. Can you overfeed the Yeast Beast?

*Seal the container to avoid ventilation that may interfere with your data!*

*1/2 cup of warm **water** + **yeast** + **sugar** and databot™ inside a container.*

*Initial setup*




*Example CO2 graph during the fermentation process.*