

Science: Growing yeast!

Ages: 7 - 13

In regards to the Homemade bread day (November 17th), let us try some yeast experiment. Yeast are **single-celled** fungi. Yes, that means they are living creatures – even though they don't seem like one! As fungi, they are related to the other fungi that people are more familiar with, like the mushrooms that you buy at the store. A common yeast that is used in many homes is baker's yeast used in baking bread. Yeast cells are egg-shaped and can only be seen with a microscope. It takes 20,000,000,000 (twenty billion) yeast cells to weigh one gram.



Yeast under the microscope

The scientific name for the yeast that bakers use is *Saccharomyces Cerevisiae*, or “**sugar-eating fungus**”. A very long name for such a tiny organism! This species of yeast is very strong and capable of **fermentation**, the process that causes bread dough to rise.

Yeast cells digest food to obtain energy for growth. Their favorite food is sugar. In this experiment we will see what sugar does to yeast.

Materials Needed:

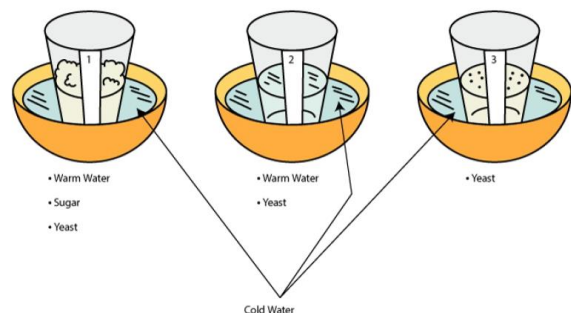
- 3 clear glass cups
- 3 bowls
- 1-2 stir sticks
- Sugar
- Baker's yeast (packets or bottle)
- Warm Water
- Cold water



Time: 30 minutes to 1 hour

Steps:

1. Fill all three dishes with about 2 inches of cold water
2. Place your clear glasses in each dish and label them 1, 2, and 3.
3. In glass 1, mix one teaspoon of yeast, $\frac{1}{4}$ cup of warm water, and 2 teaspoons of sugar.
4. In glass 2, mix one teaspoon of yeast with $\frac{1}{4}$ cup of warm water.
5. In glass 3, place one teaspoon of yeast in the glass.
6. Observe each cups reaction. Try using more of your senses to evaluate your three glasses; sight, touch, hearing and smell especially!

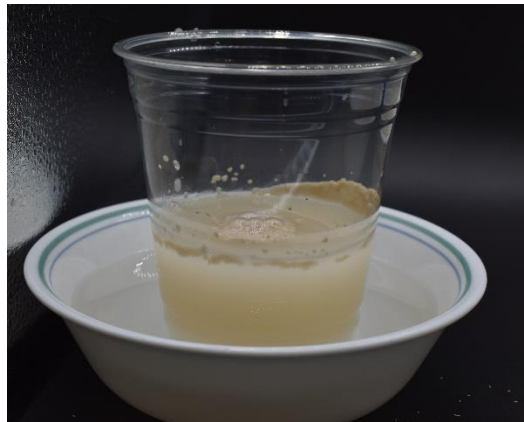


7. Stir contents in the glass containers well and let them sit for at least 30 minutes.

Why do you think the reactions in each glass differed from one another?

8. What happens if you leave them for 1 hour?

Results: You can observe the container that has sugar and yeast begins to foam (see the bubbles)



Read World Science: Baking Bread



Breads that use yeast are different from all other baked goods. It takes several steps to bake bread, and one step is to put the dough in a warm place and wait for it to rise. But why is that step so important—and why does bread dough rise, anyway?

Bread recipes call for “active dry yeast.” As they are living organisms, they need to eat, and they love sugar. In a process called fermentation, the yeast feasts on any sugar in the bread dough and then *burps*! In the bread world, burping isn’t rude—the yeast is creating air bubbles in the bread dough.

The stretchy part of bread that holds the gas is called gluten. Gluten is formed when the proteins in flour come in contact with water, and as the two ingredients are kneaded, more and more gluten forms. This stretchy molecule traps air bubbles inside the dough.

Bread rises because yeast eats sugar and burps carbon dioxide, which gets trapped by the bread’s gluten. The more sugar your yeast eats, the more gas that gets formed, and the higher the bread rises!

The yeast in glass 1 was activated by adding warm water and sugar. The foaming results from the yeast eating the sugar. Did glass 1 smell different? Typically, the fermentation process gives off heat and/or gas as a waste product. In this experiment, glass 1 gave off carbon dioxide as its waste. You might have experienced a slight fowl smell.

Yeast microbes react different in varying environments. Had you tried to mix yeast with sugar and cold water, you would not have had the same results.

The environment matters, and if the water were too hot, it would kill the yeast microorganisms. The yeast alone does not react until sugar and warm water are added and mixed to create the fermentation process.

That is all for now. Happy experimenting!