



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences –particularly students of color and girls – by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at www.projectexploration.org/stemathome.

In this activity, you will:

learn how to make bread in a bag!



Supplies Required:

- 3 cups plain flour (divided)
- 3 tbsp of sugar
- 1 .25 oz packet of rapid rise yeast
- 1 1/2 tsp of salt
- 1 cup of warm water
- 3 tbsp olive oil
- 1 large ziploc bag
- 1 bread loaf pan/ casserole or pan

Video

Learn from these kids on how to make your bread in a bag: <https://tinyurl.com/ydchkj2a>

Overview

Bread making is chemistry! To make a loaf of bread, the basic ingredients you need are: flour, yeast (to make the bread rise?), salt (to add taste and aid proving), vegetable fat (to make the loaf lighter and airier and extend its shelf life), and water. But what do each of these things bring to the party?

Almost all breads today are leavened, which means that a substance has been added to the dough to start fermentation and make it rise. The most popular and widely known leavening ingredient is yeast. Yeast is a microorganism, one of the tiniest forms of life. The air around us is full of thousands of different kinds of yeast. If it is given warm, damp surroundings and starchy or sweet matter, it will start to breed. As the yeast multiplies, it turns starches and sugars to alcohol and produces carbon dioxide gas. It is this gas that adds the air into the dough, and makes it increase in size. Yeast used by bakers is called *Saccharomyces cerevisiae*. It was originally a byproduct of brewing beer (when the yeast was used for the alcohol, rather than the carbon dioxide, it produced). Today it is cultivated commercially in laboratory conditions, and sold as fresh, compressed or dried yeast. Yeast must be mixed with a warm liquid before adding it to flour. If the liquid is too cool, the yeast won't multiply; if it is too hot (over 43°C), the yeast will be killed. The important protein found in flour is gluten. Gluten gives the dough softness, so that it can expand when the gas bubbles produced by the yeast form. It also gives the dough strength so the gas bubbles do not burst.

Instructions

1. In a large bowl, place the ziploc bag inside, overlapping the bowl
2. Pour in 1 cup of flour, 3 tbsp of sugar, 1 .25 yeast packet, 1 cup of warm water; mix all ingredients inside the bag by massaging
3. Seal the bag (be sure to let out all of the air) and let sit for 10-15 min
4. Open the bag add 1 cup of flour, 1 1/2 tsp of salt, 3 tbsp of olive oil, mix all ingredients by massaging
5. Add another 1 cup of flour, and mix again by massaging
6. Sprinkle flour on your workspace, remove dough onto flour workspace and knead for 10 min
7. Cover with clean warm damp hand towel for 30 min
8. Place dough in a greased pan and bake for 25 min at 375 degrees
9. Let your bread cool for 5 -10 min and enjoy!

Additional Resources

1. Learn more about the magic of baking bread: <https://tinyurl.com/yce9ehk7>
2. Learn more about the yeast-sugar reaction: <https://tinyurl.com/joxuxuk>
3. Explore a bakery and learn more about bread: <https://tinyurl.com/y8ucepx4>

Share It Out

Share on social media: Share your recipe with others by making a mini video and uploading on your choice of social media! Tag your favorite chef or bakery! What makes your bread the tastiest!?

Use the hashtags:

#BreadInABag
#ProjectExploration
#StemAtHome

Share via PE's website: Students who complete STEM@home activities and share what they learned with the PE team via our website will earn points which can be traded in for cash prizes at the Explore Store. Your project number is 210. Learn more at www.projectexploration.org/explore-store

Join PE's character contest!

Design a STEM character who will lead kids through activities and be featured on our website and in our STEMbooks. Cash prizes will be awarded to the top 3 finalists. Learn more at: www.projectexploration.org/character-contest.



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