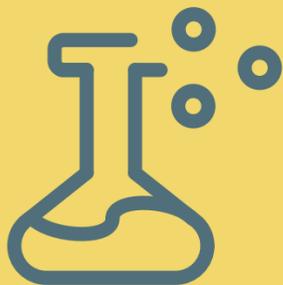


Science Behind: Bread in a Bag

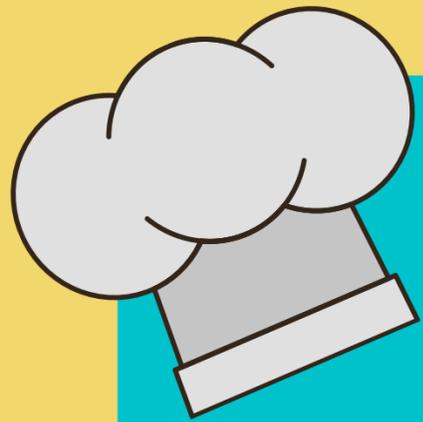
Bread has only a couple of ingredients, so how much science can there be in a loaf of bread? Well, there's a lot! Most breads are made with: flour, water, a leavening agent, and salt. So, let's look at each ingredient and see how they react to each other and what they add to bread. Flour is made by grinding up kernels of grain (or seed) into a powder called Flour. Wheat flour is the most common one used in North America. Flour has two important protein molecules needed to produce bread – glutenin and gliadin.

When flour and water are mixed together the glutenin and gliadin become gluten. Gluten is a tightly wound mess of protein strands but when it is kneaded these strands unravel, stretch and rearrange themselves into a strong structured network of protein strands called dough. This network is both elastic and plastic meaning it will change shape easily but will always try to move back to its original shape when left alone. Starch is also a very important molecule found in flour. Amylase is an enzyme found in flour which breaks down the starch into glucose and maltose when water is added into flour.

Yeast is for leavening in many types of bread. A leavening agent is a substance that causes expansion of doughs and batters by releasing gases into the mixtures, producing baked products with porous structure. Examples of leavening agents includes baking powder, baking soda, steam, heat, air and, like we use in this recipe, yeast. Yeast is a single cell fungus that feeds on the glucose from the starch. Yeast metabolizes the sugars and, as the yeast multiplies, it creates carbon dioxide. This carbon dioxide gets trapped the gluten network and creates bubbles making the dough expand and creating the fluffy, porous, foam like texture of bread. Finally, we have salt. Salt curtails the yeast growth by slowing the fermentation. It also adds to the flavor and elasticity of the dough.



COBB 4-H SPIN CLUB: KITCHEN SCIENCE



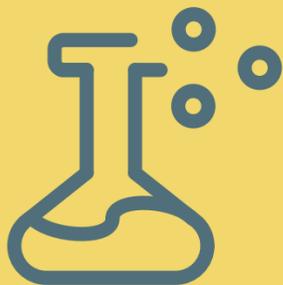
Bread in a Bag Ingredients & Supplies

What's included in your kit:

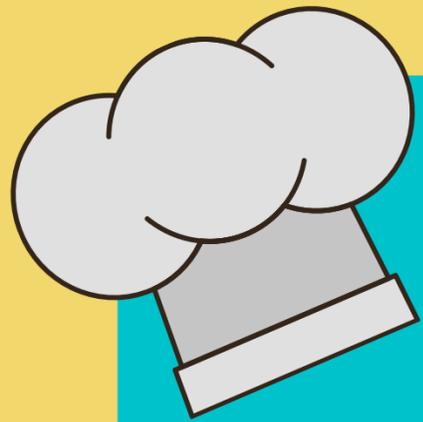
- 1 large resealable plastic bag
- 3 cups flour
- 1 0.25 oz. packet fast rising yeast
- 3 Tablespoons white sugar
- 3 Tablespoons oil
- 2 loaf pans

What you need:

- 1 cup warm water
- large bowl
- small bowl
- measuring spoons
- liquid measuring cup
- dry measuring cup
- mixing spoon
- 1 1/2 teaspoon salt



COBB 4-H SPIN CLUB: KITCHEN SCIENCE

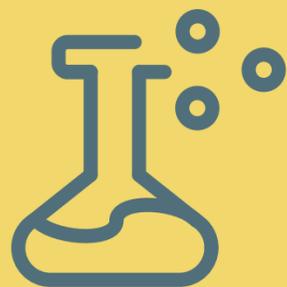


Bread in a Bag Instructions

In a large resealable zipper bag, add 1 cup of flour, 3 tablespoons of white sugar, 1 packet of yeast and 1 cup of warm water. Press as much air out of the bag as possible and close tightly. Now mix and squish the bag with your hands until the dough is uniformly mixed. Set aside to rest for 10 minutes at room temperature, or until the CO₂ bubbles appear and the bag inflates.

In a small bowl, stir together 1 cup of flour, 3 tablespoons of oil, and 1 1/2 teaspoons of salt. Pour into the bag and again press out as much air as possible. Close and squish until well mixed. Add the last cup of flour to the bag, and mix until the dough is uniformly mixed and no flour pockets exist. Remove the dough from the bag and place on a lightly floured surface. Knead for 8 to 10 minutes. Form into two loaves, and place into greased 8"x4" inch loaf pans. You can use mini loaf pans instead if you'd like.

Cover with towels, and let to rise for about 30 minutes, or until your finger leaves an impression when you poke the top of the loaf. Colder areas may require longer rise times. Preheat the oven to 375 degrees F. Bake the bread for 35 minutes in the preheated oven, until golden brown. Let cool, slice, and serve.



COBB 4-H SPIN CLUB: KITCHEN SCIENCE