

No Knead Bread

Estimated Time: About 24 hours, but about 45 minutes actively

SUMMARY

In this activity, kids learn about the complex ecosystem and chemistry that leads to a baked loaf of bread. This recipe helps deliver a delicious loaf of bread without kneading, allowing even children to do most of the work to create their own bread.

WHAT YOU'LL LEARN

- That yeast is a living thing
- How yeast makes bread rise
- That the mass of something doesn't change just because of the size

Materials Used	Resources Used
<ul style="list-style-type: none"> • 3 1/3 cups all-purpose or bread flour plus extra for dusting • 1/4 teaspoon of yeast • 2 teaspoons of salt • 1 1/2 cups plus 2 tablespoons water • 1 large mixing bowl • Plastic wrap • 2 cotton towels (not terrycloth bath towels) • 1 pot w/ lid (preferably heavy, such as enameled cast iron or Pyrex-like glass) for baking • A kitchen scale • A camera • A thermometer 	<ul style="list-style-type: none"> • NYT No Knead Bread Recipe - https://cooking.nytimes.com/recipes/11376-no-knead-bread

WHAT TO DO

This activity relies heavily on the New York Times' recipe found in the resources section. The steps are meant to help guide how STEM content can be added while following the recipe.

1. Add flour, yeast, salt, and water to a mixing bowl. Before mixing find the mass or weight of the bowl and ingredients and write this measurement down.
2. Stir the ingredients until it forms a sticky ball of dough. Find and record the mass of the bowl and ingredients again and compare the measurements. Also take the temperature of the dough.
3. Cover the bowl with plastic wrap tightly and set the bowl aside in a room temperature place for 12-18 hours.

- a. The dough will begin to rise as it's left out. Periodically, take pictures of the dough as it rises and take observations. Is it getting bigger? Does it look the same? Is there water coming out?
 - b. What is happening in the dough is that you are creating an ecosystem where yeast grow. The yeast is eating sugars/starches in the flour and creating gas (convey this however you wish to your children).
 - c. As the gas rises through the dough, it lifts parts of the dough and creates bubbles within the dough. Special proteins, mostly gluten in this case, allow the dough to hold the shape and "catch" more of the gas as it rises.
4. After 12-18 hours, find the mass of the bowl and dough again and record it. It should be the same, even though the dough is much bigger. Take the temperature of the dough and see if the yeast eating the dough made it warmer or cooler.
 5. Sprinkle some flour onto a work space and onto the dough, then fold the dough over itself 2 or 3 times and shape it into a circular loaf.
 6. Lay a towel down on the work surface and sprinkle it with flour, spreading the flour around on the towel to prevent any empty spots. Place the dough on the towel, sprinkle with a little more flour, and cover with a second towel. Let the dough rise for 2 hours like this.
 7. Preheat an oven to 450 degrees with the pot you will be baking the bread in inside the oven.
 8. When it is preheated, carefully transfer the dough to the pot, place the lid on, and cook for 30 minutes. The lid being on will allow the yeast to continue to work and eat and the bread to rise one last time.
 9. Remove the lid and bake until the loaf is golden brown, another 15-30 minutes.

TIPS

- At each stage, taking the mass measurements proves that the size changing doesn't change the total amount of matter that's there.
- The yeast will heat the dough as it works, but will also help the dough rise faster the hotter it is. It will rise very rapidly in the oven.