

You've Got Flour! Baking STEAM

*Bake to meet core literacy, math, art and science education standards while building life skills.
Sharon Davis, Family & Consumer Sciences Education, HomeBaking.org*

Lesson: Sourdough Baking

Time: Five days to prepare the sourdough starter; one day for bread or 1 hour for pancakes

Level: Middle School/Junior High

What you'll do and learn:

- Research what a sourdough is and list its ingredients and important temperatures <https://www.kingarthurflour.com/learn/guides/sourdough>
- Apply accurate measuring methods for flour, sugar, leavening, salt, liquids to prepare a sourdough starter
- Form a hypothesis, measure and record observations when using a variable and the control starter
- Read and follow directions to prepare, maintain, and bake sourdough starter and pancakes or bread from the starter.
- Learn and apply baking techniques to produce pancakes or bread.

What you'll bake: Sourdough Pancakes or Bread.

Before you begin:

- **View** How to Measure for Baking, homebaking.org/distance-learning/
- **Download and do** Measure UP! Worksheet, homebaking.org/lesson-plans/
- **Read** What is Yeast? redstaryeast.com/science-yeast/what-is-yeast/
- **Read or view** the [Yeast Activity Test](#) and see how healthy yeast grows and the temperatures best suited for growth.

Question 1: What IS yeast? Is it a plant, animal, bacteria, fungi/fungus or??

Question 2: What does yeast eat to grow?

Question 3: When did humans discover and begin baking with yeast?

Question 4: What are the ingredients in a sourdough starter?

Question 5: What is sourdough and where did it begin?

Prepare a Sourdough Starter

**Sourdough starter may also be made with water and flour, relying on natural yeast in the air and flour.*

2 cups (16 oz) water, room temperature (68° to 70°F)

3½ cups (15 oz/425g) all-purpose flour

1 teaspoon (3 g) active dry yeast

1 Tablespoon (3 teaspoons) sugar

Instructions:

1. In a 4-quart nonmetallic container, dissolve yeast in warm water (110° to 115° F); let stand 5 minutes. Add flour and sugar. Stir by hand until blended. The mixture will be thick; any remaining lumps will dissolve during the fermentation process. Cover loosely with plastic wrap. Let stand in warm place for 5 days, stirring 2 to 3 times each day. The starter will rise and fall during the fermentation period; it becomes thinner as it stands. A temperature of 80° to 85° F is best for developing the sour flavor. When the starter is developed, it is bubbly and may have a yellow liquid layer on top; stir starter before using. The starter can be used for baking or placed in the refrigerator for later use.
2. To use the starter, measure out desired amounts as specified in the recipe. Let refrigerated starter come to room temperature before using; this will take about 4 hours.
3. After using a portion of the starter for a recipe, replenish remaining starter with 3 parts flour to 2 parts water (example: if you use 1 cup starter, add back 1 cup flour and ⅔ cup water) and 1 teaspoon sugar. Stir until blended; some lumps may remain. Cover loosely and let stand in warm place for 10 to 12 hours or overnight. The starter will rise and become bubbly. Stir and store in refrigerator. If the starter is not used every week, stir in 1 teaspoon sugar to keep it active.

Recipe featured at redstaryeast.com from [My Kitchen Addiction](#).

*Sourdough starter guide.

<https://www.kingarthurflour.com/learn/guides/sourdough/create>



What you'll need:

Download:

[Measure UP!](#)

[Worksheet](#)

View: [How to Measure Ingredients](#)

Tools:

Measuring cups—

liquid and dry

Measuring spoons

Two, 2 qt. glass

containers/jars

Plastic food wrap

Food thermometer

Measuring tape or

ruler

Baking pan or cast iron

skillet or griddle

Ingredients:

Starter, yeast, flour,

water, sugar (optional)

See recipe for bread or

pancakes



Sourdough Starter Experiment:

Step 1: Divide the ingredients in **half**. Prepare the **control** starter in Jar #1

Jar #1: Prepare half the starter recipe ingredients as directed.

Step 2: Jar #2: Use the other half of the ingredients and choose a **variable**.

Variable options:

1. Omit the sugar
2. Omit the active dry yeast—rely on the yeast that is naturally in the air and flour
3. Substitute whole wheat flour for all-purpose enriched wheat flour.

What's your hypothesis of what differences may occur between the control and the variable starters?

Step 3: Create a 5-day diary or chart to write observations for Jar #1 and Jar #2.

- **Each day at the same time if possible, measure** how tall the sourdough has grown in the jar. **Remember the sourdough may collapse. Review the instructions for its care to remind you.**
- **Note if you stir the Jar #1 (control) mixture, do the same for Jar #2 (variable).**
- **Describe** what each mixture looks like Day 1, Day 2, Day 3, Day 4, Day 5. Include visual and aroma description.



Bake Sourdough Bread or Pancakes!

It's ALIVE! Now that you have a new starter, you can bake with part of the starter plus feed the starter to keep it going. If you don't bake with it you still need to remove starter and feed the starter. See NOTE.

Sourdough Rolls 2019 *Best of Bread*, p. 14-Senior Division, Leslie Munhollon, www.okwheat.org

Great for sandwiches or dinner rolls. See [How to Shape Rolls](#).

Tip; Mix dough before going to bed, cover and let rise/ferment overnight (Step 3)

1. Stir the starter, measure out 1-¼ cups. Feed sourdough and refrigerate as directed.

2. In a large bowl, make a soft dough of the following ingredients:

4 cups unbleached enriched flour – (stir to fluff, spoon into dry cup and level off)

¾ cup vegetable oil or shortening

½ cup sugar

3 teaspoons salt

2 cups warm (105°F) water

1 ¼ cup starter (Warm to room temperature- 68 to 70°F)

3. Place dough in a large greased bowl and cover loosely with plastic wrap. Allow dough to rise (ferment) in warm (70°) place until it doubles in size, about 6-8 hours.

4. Divide dough evenly into 30 pieces for rolls. Shape and place on greased pans. Allow dough to rise again in a warm place until it doubles in size – usually 2 to 3 hours. Bake at 350° until golden brown. Brush with butter. Remove from pans and cool. Makes 2 ½ dozen rolls. Photo: NationalFestivalofBreads.com

NOTE: Every week or two, remove 1 cup of starter, then feed the starter by replacing it with 1 cup flour, 2/3 cup of water. Allow the replenished starter to sit at room temperature for about 8-12 hours, and then refrigerate it.

Sourdough Pancakes Source: *A Bakers Dozen Labs, Yeast, HomeBaking.org*

Ingredients

1 cup (8 oz/240ml) milk, warm to 90°F

1 ¼ cups (5 oz/142g) unbleached flour (may be part whole wheat flour)

½ cup (4 oz/115g) sourdough starter

1 Tablespoon (0.5 oz/14g) vegetable oil or melted butter

1 large egg (1.6 oz/47g), room temperature

½ teaspoon table salt

1 Tablespoon (0.5 oz/14g) brown or white sugar

1 teaspoon (4.5g) baking soda

Directions: Combine milk, flour and starter in a large mixing bowl and allow to stand 20-30 minutes.

2. Stir in remaining ingredients. Don't over mix--batter may be slightly lumpy.

3. Lightly grease a griddle or skillet and heat until hot-- 450°F. Pour ¼ cup batter per pancake on the hot griddle. Turn when edges brown and bubbles are breaking on the surface and bottom is golden. Flip only once. Serve warm with applesauce or warmed syrup or honey.

