Make White Pan Bread

Description
In this activity, students will make two loaves of white pan bread from scratch. The students will be able to identify the different stages of the process. They will read a basic white pan bread recipe, scale the recipe to yield two loaves, gather ingredients and tools, measure ingredients accurately, mix, make-up, proof, and bake the loaves.

For this bread, a straight dough mixing method will be used, exposing the student to the basic methodology behind yeasted doughs.

Lesson Objectives
Students will be able to:
• understand ingredients and their function in bread-making
• calculate the number of ingredients needed to produce the desired amount of product
• prepare bread using safe food handling practices with appropriate equipment, according to recipe or formula
• apply knowledge of the straight dough mixing method to produce bread, and
• evaluate the finished product.

Safety Considerations
Basic food and kitchen safety

Assumptions
Students have an understanding of ingredient measurement, food handling safety, and appropriate clothing and personal attire in kitchens.

Terminology
Bench/counter: A work space of appropriate height and material for processing recipes.

Bread flour: Flour that is formulated for typical North American breads, with protein content of 11–13.5%.

Caramelization: The process by which the sugars turn the crust of the loaf to a golden-brown color during the baking process.

Bread pan: A container (usually made of metal) used to proof and bake a loaf of bread.

Crumb: The quality and texture of the interior of the loaf.

Fermentation: The process where yeast changes carbohydrates into alcohol and carbon dioxide.
Formula: A balanced recipe containing the list and weights of ingredients, procedure, and yield.

Gluten: Proteins found in wheat flour that develop a matrix within which carbon dioxide gasses are trapped.

Hydration: The amount of water in a bread dough.

Mixing machine: A machine for processing ingredients into finished doughs or batters.

Oven-spring: The increase in volume of the loaf during the baking process.

Plastic scraper: A flexible bowl scraper that has a curved edge and a straight edge. Has multiple uses, and in this context, is used for scraping or cleaning up batter or dough in a bowl or from the table.

Proof: The stage in which yeast ferments in the presence of flour and water, releasing carbon dioxide gas and causing the loaves to rise.

Scaling: The act of measuring ingredients in weight or volume; usually the first step in the baking of products.

Shaping: The act of taking a piece of dough and forming it into a uniform loaf.

Starch: The part of the wheat endosperm that gelatinizes and forms the crumb of the loaf.

Straight dough mixing method: A mixing method used for bread-making, where all ingredients are added and mixed at once.

White pan bread: Bread that is baked in a loaf pan and typically made with white flour or all-purpose flour, water, yeast, and salt.

Estimated Time

45 minutes: Activity.

4 hours: Inactive time (dough can be refrigerated overnight and baked the following day).

Recommended Number of Students

This activity may be done individually or in pairs.

Facilities

Home Economics lab or cafeteria kitchen
Resources

The Baking Process
https://www.youtube.com/watch?v=CQ32r4ZYJ5A

Making Bread By Hand
https://www.youtube.com/watch?v=7xJiBJxP-4s

Moulding Pan Bread
https://www.youtube.com/watch?v=wJrOqWgir9I

The Windowpane Or Membrane Test
https://www.youtube.com/watch?v=iyb86ECObTM

Science: What Is Gluten? Here’s How To See And Feel Gluten
https://www.youtube.com/watch?v=zDEcvSc2UKA&t=2s
Demonstrating Skills And Knowledge

Procedure

1. Ahead of class, gather the necessary materials:
   - As per recipe; enough for all the students
   - Digital scales
   - Recipe calls for instant yeast (rapid or bread machine yeast is the same). If using active dried, double the quantity and hydrate before using.
   - If bread flour is not available, make sure that the protein content on nutritional panel shows 4 g per 30 g serving or equivalent.
   - Bread pans for all the students. If not enough are available the bread can be baked on a sheet pan with parchment paper.
   - For variety brush with egg-wash and sprinkle seeds on top.
   - Oil for greasing pans
2. Review safety procedures.
3. Review video on bread baking and procedural steps.
4. Divide students into pairs if necessary.
5. If a scale is not available, have the students calculate the conversion from grams to volume measurement (cups and spoons).
6. Follow the procedure as per the recipe.
7. Have the students check the gluten development by using the “windowpane” test.
8. Watch procedural videos during the first proof stage.
9. During baking, explain or have students research the gelatinization of starches, coagulation of proteins, caramelization of sugars, and why the dough has to rest.
10. Wait for bread to cool before eating (in order that all the starches set; carry over baking).
**Evaluation Guidelines**

Consider co-creating the assessment criteria with your students at the beginning of the activity/project. You may want to include the following:

<table>
<thead>
<tr>
<th></th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
<th>Extending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintains personal hygiene and grooming.</td>
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<tr>
<td>Maintains workspace, tool, and equipment cleanliness.</td>
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<tr>
<td>Applies mathematical principles to appropriately scale recipe to desired yield.</td>
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<tr>
<td>Measures ingredients accurately.</td>
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<tr>
<td>Mixes, makes-up, and proofs bread dough for uniformity, smoothness, and desired volume.</td>
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<tr>
<td>Demonstrates ability to evaluate for doneness during baking.</td>
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<tr>
<td>Cools and stores bread properly.</td>
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<tr>
<td>Demonstrates ability to evaluate baked bread for quality, taste, and texture in the form of self-reflection notes.</td>
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</tbody>
</table>
Optional Student Self-assessment

Introduce the following chart to the students. Instructor can evaluate a finished loaf (instructor-baked or from a student volunteer) to demonstrate the various categories to the students.

<table>
<thead>
<tr>
<th>External Qualities</th>
<th>Top Score</th>
<th>Test Score</th>
<th>Penalized for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate volume</td>
<td>8</td>
<td></td>
<td>Too small, too large</td>
</tr>
<tr>
<td>Correct crust colour</td>
<td>6</td>
<td></td>
<td>Streaked, spotted, too dark, too light, not uniform</td>
</tr>
<tr>
<td>Symmetry of loaf</td>
<td>4</td>
<td></td>
<td>Uneven shape, flat top, shrunken</td>
</tr>
<tr>
<td>Evenness of bake</td>
<td>4</td>
<td></td>
<td>Pale sides dark top, dark bottom, light top</td>
</tr>
<tr>
<td>Characteristics of crust</td>
<td>4</td>
<td></td>
<td>Tough, thick, blistered, hard</td>
</tr>
<tr>
<td><strong>External score</strong></td>
<td><strong>26</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal qualities</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taste</td>
<td>15</td>
<td></td>
<td>Rancid, sour, greasy, flat, salty</td>
</tr>
<tr>
<td>Aroma/flavour</td>
<td>15</td>
<td></td>
<td>Chemical, yeasty, lacks depth</td>
</tr>
<tr>
<td>Texture</td>
<td>10</td>
<td></td>
<td>Lumpy, dry, wet, rough, sandy, crumbly</td>
</tr>
<tr>
<td>Crumb</td>
<td>10</td>
<td></td>
<td>Open coarse grain, uneven cell structure</td>
</tr>
<tr>
<td>Chewability</td>
<td>10</td>
<td></td>
<td>Gummy, doughy, tough, dry</td>
</tr>
<tr>
<td><strong>Internal score</strong></td>
<td><strong>60</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total score</strong></td>
<td><strong>86</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**White Pan Bread**

**Ingredients**
- 600 g bread flour
- 6 g instant (rapid) yeast
- 12 g salt
- 400 g water

**Preparation**
1. Mix the ingredients by hand or by machine:

   **By Hand**
   a. Add yeast to water and evenly disperse.
   b. Add flour and salt and mix by hand until coarse dough is formed. Cover and allow dough to rest for a few minutes.
   c. Knead the dough for 20 seconds or until it resists. Form into a ball, cover, allow to rest for five minutes. Repeat this process 5–6 times.

   **By Machine**
   a. Add all ingredients into mixing bowl and use hook attachment.
   b. Mix for one minute on slow speed.
   c. Adjust hydration if necessary.
   d. Scrape down bowl taking care to scrape right down to the bottom.
   e. Mix for another two minutes.
   f. Increase speed and mix for another two minutes.

2. Cover dough and allow to rise until double in volume.
3. Fold the dough once after 30 minutes if required.
4. Shape and mold the dough to fit a greased loaf pan.
5. All the loaves to rise until almost doubled in size.
6. Bake on middle shelf at 220°C for 30–40 minutes. (200°C if using a convection oven.)
7. Check internal temperature. (It should be 94–98°C.)
8. De-pan immediately and cool on wire rack.
9. Wait 10 minutes before cutting, eating, and evaluating.
## Conversion Table for Common Baking Ingredients

Metric (grams) to Imperial (pounds and ounces) to Volume (cups and spoons)

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Ounces per cup</th>
<th>Grams per cup (oz)</th>
<th>Grams per teaspoon (t)</th>
<th>Grams per tablespoon (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baking powder or soda</td>
<td>8</td>
<td>227</td>
<td>4.6</td>
<td>13.8</td>
</tr>
<tr>
<td>Butter</td>
<td>8</td>
<td>227</td>
<td>4.8</td>
<td>14.2</td>
</tr>
<tr>
<td>Flour (all purpose)</td>
<td>5</td>
<td>140</td>
<td>2.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Milk</td>
<td>8</td>
<td>245</td>
<td>5.1</td>
<td>15.3</td>
</tr>
<tr>
<td>Milk powder</td>
<td>3</td>
<td>125</td>
<td>1.5</td>
<td>4.25</td>
</tr>
<tr>
<td>Salt, fine</td>
<td>6</td>
<td></td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Shortening</td>
<td>8</td>
<td>227</td>
<td>4.3</td>
<td>12.8</td>
</tr>
<tr>
<td>Sugar brown</td>
<td>7</td>
<td>200</td>
<td>4.6</td>
<td>13.4</td>
</tr>
<tr>
<td>Sugar white, granulated</td>
<td>7</td>
<td>200</td>
<td>4.2</td>
<td>12.5</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>7</td>
<td>220</td>
<td>4.5</td>
<td>13.7</td>
</tr>
<tr>
<td>Water</td>
<td>8</td>
<td>237</td>
<td>5.3</td>
<td>14.8</td>
</tr>
<tr>
<td>Yeast instant rapid</td>
<td></td>
<td></td>
<td>2.8</td>
<td>8</td>
</tr>
</tbody>
</table>

**Important note for students:** Volume measurements of baking and cooking ingredients are extremely variable; that is why weighing is the preferential method of measurement.