

Creative Chef

Leavening Agents Lab

Objective: The students will understand which chemical reactions occur that cause baked goods to rise. By gaining this knowledge, the students will be able to predict what will happen when a recipe is followed. The students will learn to expect the same results repeatedly if they measure accurately and follow the procedures for the recipe exactly. The students will apply the concept of leavening agents across various recipes, replicating results in each recipe. The students will transfer results from scientific experimentation to food preparation. From this experience the students will know the scientific nomenclature for the reactions of baking soda, baking powder and yeast, and be able to apply this knowledge in the production of baked goods.

1. **Hypothesis:** If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of cold water into a small bowl.
- Add 1 teaspoon (5mL) of baking powder. Stir.
- Observe. Record results below.

2. **Hypothesis:** If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.
- Add 1 teaspoon (5mL) of baking powder. Stir.
- Observe. Record results below.

3. **Hypothesis:** If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.

- Add 1 teaspoon (5mL) of baking powder. And 1 teaspoon (5mL) vinegar. Stir.
- Observe. Record results below.

4. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.
- Add 1 teaspoon (5mL) of baking soda. Stir.
- Observe. Record results below.

5. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water and 1 tablespoon (15mL) vinegar into a small bowl.
- Add 1 teaspoon (5mL) of baking soda. Stir.
- Observe. Record results below.

6. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of ice cold water into a small bowl.
- Add 1 teaspoon (5mL) of yeast. Stir.
- Observe. Record results below.

7. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.

- Add 1 teaspoon (5mL) of yeast. Stir.
- Observe. Record results below.

8. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of water into a 2 cup (500mL) liquid measuring cup.
- Bring to a boil in the microwave. Remove from microwave.
- Add 1 teaspoon (5mL) of yeast. Stir.
- Observe. Record results below.

9. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.
- Add 1 teaspoon (5mL) of yeast. Add 1 teaspoon (5mL) sugar. Stir.
- Observe. Record results below.

10. Hypothesis: If I _____, then I think

_____ will happen because

_____.

Procedure:

- Measure 250mL of hot tap water into a small bowl.
- Add 1 teaspoon (5mL) of yeast. Add 1 teaspoon (5mL) sugar. Add 1 teaspoon (5mL) salt. Stir.
- Observe. Record results below.

Data:

Variable

Observations

1. Baking Powder	Cold Water	
2. Baking Powder	Water	
3. Baking Powder	Water; vinegar	
4. Baking soda	Water	
5. Baking soda	Water; vinegar	
6. Yeast	Ice water	
7. Yeast	Warm water	
8. Yeast	Boiling water	
9. Yeast	Water and sugar	
10. Yeast	Water, sugar, and salt	

Analyze:

- 1) What patterns do you notice in the baking soda experiments? How were they different from the other leavening agents?
- 2) What patterns do you notice in the baking powder experiments? How were they different from the other leavening agents?
- 3) What patterns do you notice in the yeast experiments? How were they different the other leavening agents?

Follow-Up questions:

- 1) What did you notice happening when all of the leavening agents were “working”? How might this allow a baked good to rise?
- 2) If you have a recipe that uses yeast, what would be required for the baked good to rise, based on your experiments?
- 3) If you have a recipe with an acidic ingredient (like vinegar or buttermilk), what might be a good leavening agent to result in a good rise?
- 4) If you want a baked good that uses baking powder to rise, what conditions should be present, based on your experiments?