

CHANGE THE RECIPE

Performance Standards 12C/11A/13A.H

Students will apply the processes of scientific inquiries to examine the chemical and physical characteristics of matter accordingly:

- *Knowledge*: understand the basic utility and characteristics of fats used in baking applications.
- *Application*: investigate a variety of fats used in similar baking for comparative results.
- *Communication*: report findings of investigation for comparison of properties of fats used in baking.

Procedures

1. ***In order to know and apply concepts that describe properties of matter and energy (12C); the concepts, principles and processes of scientific inquiry (11A); and the accepted practices of science (13A)***, students should experience sufficient learning opportunities to develop the following:

- Generate inquiry questions about the similarities and differences of fats used in baking.
- Determine criteria for comparisons (softness, crunch, taste, etc.)
- Conduct an investigation which compares different fats in a simple recipe.
- Follow all procedural and safety precautions and material and equipment handling directions.
- Collect observations of comparative recipe products according to class-determined criteria.
- Evaluate evidence from observations according to class criteria.
- Explain the necessity of manipulating only one variable (choice of fat) at a time.
- Explain the application to family and consumer science occupational decisions.

Note to teacher: This activity relates to knowledge associated with Standard 12C, while addressing Performance Descriptors for Stage H within Standard 11A. Applying the accepted practices of science addresses Performance Descriptors in 13A. Family and Consumer Sciences students will enhance their knowledge of the properties of common food ingredients. They will use the scientific method to identify each ingredient in an experimental applied technique. A food stylist looks at properties of ingredients to design a look-alike product that will hold up under the camera lights. They will expand their knowledge of careers at a test kitchen. This could be expanded to discuss health concerns, which would make recipe alterations necessary. This relates to the dietetics and nutrition theory. This assessment applies to the National Family and Consumer Sciences Standard #9.0 (Food Science, Dietetics and Nutrition/Integrate knowledge, skills and practices required for careers in food science, dietetics and nutrition). This assessment will evaluate nutrition principles, food plans, preparation techniques and specialized dietary plans (9.3). This could be used as an application or assessment through Family, Career and Community Leaders of America (FCCLA) STAR Events (Illustrated Talk) and Student Body (Nutrition-related education project).

2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Begin this investigation with a discussion about personal preferences about cookies. Provide background information about the human taste preference and nutritional necessities of fats in the diet. This investigation will focus on the effect of different fats in a standard cookie recipe. Begin the comparison of the different fats (butter, margarine, shortening, oil, etc.) according to student-generated categories (calories, melting point, texture, etc.) Extend this comparison into the actual use of the different fats into the same recipe. Students should design a test kitchen experiment which involves the alteration of a cookie recipe by adjusting the fat used (butter, margarine, shortening, oil, etc.) Students will evaluate the cookie in comparison to the original recipe with quantitative measurements, such as the height of the cookie and the amount the cookie spreads when baking. Cookies could also be evaluated with a sensory evaluation of taste, smell and mouth feel. Students will design a data table to record the results. They will present their findings and vote for best choice according to their personal categories for preferences. (Emphasize multiple preferences with specificity.)
4. Evaluate each student's work using the Science Rubric as follows, and add the scores to determine the performance level:
 - *Knowledge*: The explanation about the contribution of fats to baking is complete and accurate.
 - *Application*: The baking investigation and data analysis was completed carefully and accurately according to procedures.
 - *Communication*: The evaluation of the baking investigation was complete and thorough.

Examples of Student Work

- [Meets](#)
- [Exceeds](#)

Time Requirements

- One class period to design experiment
- One class period to complete experiment and evaluate
- One class period to complete comparisons and analysis

Resources

- Original Cookie Recipe
- Appropriate web sites:
 - www.recipesource.com
 - www.foodsubs.com
 - www.switcheroo.com
 - www.ochef.com
- Kitchen ingredients, materials and equipment for recipe
- Butter, margarine, shortening and oil for comparative use
- Scientific Rubric

SCIENCE RUBRIC

Exceeds - must receive no more than one 3 and the rest 4s in the other areas of the rubric.

Meets - may receive no more than one 2 and a combination of 3s and 4s in the other areas of the rubric.

Approaches - may receive no more than one 1 and a combination of 2s, 3s or 4s, in the other areas of the rubric.

Begins - must receive at least a 1 in all 3 areas of the rubric.

	KNOWLEDGE	APPLICATION	COMMUNICATION
	Knows and understands scientific terms, facts, concepts, principles, theories and methods.	Applies scientific knowledge, skills and methods to manipulate, analyze, synthesize, create and evaluate.	Communicates scientific knowledge and applications through writing, speech and visual displays.
4	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are complete and correct. 	<ul style="list-style-type: none"> • Applications are thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Written, oral and/or visual communication is well organized and effective.
3	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are mostly complete and correct. 	<ul style="list-style-type: none"> • Applications are mostly thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Most of the written, oral and/or visual communication is well organized and effective.
2	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are somewhat complete and correct. 	<ul style="list-style-type: none"> • Applications are somewhat appropriate and accurate. 	<ul style="list-style-type: none"> • Some of the written, oral and/or visual communication is organized and effective.
1	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are minimally present or correct. 	<ul style="list-style-type: none"> • Applications are minimally appropriate and accurate. 	<ul style="list-style-type: none"> • Little of the written, oral and/or visual communication is organized and effective.
0	<ul style="list-style-type: none"> • All descriptions of scientific terms, facts, concepts, principles, theories and methods are missing and/or incorrect. 	<ul style="list-style-type: none"> • All applications are missing and/or incorrect. 	<ul style="list-style-type: none"> • All of the written, oral or visual communication is missing and/or lacks organization.
Score			