KIRKWOOD
SCHOOL DISTRICT

Art and Science of Baking and Pastries

Approved by KSD Board of Education: (2018)

Course Description:
This is a course that offers authentic opportunities for you to build upon the beginning baking skills learned in the Art & Science of Foods I. Students will prepare scrumptious desserts such as creme puffs, macaroons, and ice cream while practicing for Cake Wars and The Next Top Baker challenges. Learn to plate eye-catching desserts along with designing your own custom cake.

Grade Levels: 9-12 (0.5 Credits)
Prerequisite: One-half credit earned in Art & Science of Foods I

Unit Scope and Sequence

Unit 1: Cookies
Unit 2: Breads/Rolls
Unit 3: Cakes
Unit 4: Fillings
Unit 5: Pastries
Unit 6: Plating

Course Enduring Understandings:

- Successful baking is grounded in scientific principles, where ingredients, heat, time, and technique interact to produce specific textures, flavors, and appearances. A deep understanding of these principles allows bakers to make informed decisions, troubleshoot problems, and consistently produce high-quality baked goods.
- Visual presentation plays a significant role in the overall baking experience, influencing perceptions of flavor and texture.
- Baking is both a craft and a science, offering students the opportunity to embrace challenges as part of the creative process. By viewing obstacles as opportunities for growth and enjoyment, students can develop a lifelong passion for baking.

Course Essential Questions:

- How do we equip students with understandings about the science behind successful bakes?
- How do we take time to experiment, play, reflect, discuss, compare and revise work?
- How do we develop an appreciation for the impact of appearance on resulting taste?
- How can we utilize technology effectively to document, extend and deepen learning?
- How can we find joy in the challenge this discipline provides while fostering a passion for baking?

Art and Science of Baking and Pastries
Unit 1: Cookies

Students will explore the baking process as it pertains to cookies, with a focus on batter and dough.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• Baking cookies is both a craft and a science.	• What actions impact the texture of a cookie?
Students must know:	***Students must be able to:***
• Basic measuring skills • Chewy cookie • Crunchy cookie • Drop cookie	• Measure ingredients. • Bake cookies. • Explain how the ratio of wet to dry ingredients impacts consistency and texture.

Art and Science of Baking and Pastries
Unit 1: Cookies

Missouri Learning Standards

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).
- Prepare breads, baked goods and desserts using safe handling and professional preparation techniques (8.5.10).
- Demonstrate professional plating, garnishing, and food presentation techniques (8.5.12).

Demonstrate principles of food biology and chemistry (9.7)
Supporting Standards:

- Explain the properties of elements, compounds, and mixtures in foods and food products (9.7.1).
- Analyze the effects of thermodynamics on chemical reactions in foods and food products (9.7.2).
- Explain the impact of molecular structure of simple and complex carbohydrates on digestion, nutrition, and food preparation procedures (9.7.4).

Art and Science of Baking and Pastries
Unit 2: Breads/Rolls

Students will explore the baking process as it pertains to breads and rolls, with a focus on yeast and dough.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• Baking breads and rolls is both a craft and a science.	• What variables impact a yeast bread's consistency and product outcome? How?
Students must know:	***Students must be able to:***
• Leaveners • Single-celled fungi (yeast) • Chemical leaveners (baking soda/powder) • Lean vs. Rich dough	• Bake breads/rolls • Knead and manipulate dough before baking. • Measure ingredients. • Explain the chemical process associated with utilizing yeast for baking purposes. • Differentiate between quick breads and yeast breads.

Art and Science of Baking and Pastries
Unit 2: Breads/Rolls

Missouri Learning Standards

Demonstrate food safety and sanitation procedures (8.2).
Supporting Standards:

- Identify characteristics of major foodborne pathogens, their role in causing illness, foods involved in outbreaks, and methods of prevention (8.2.1).
- Practice standard personal hygiene and wellness procedures (8.2.5).
- Demonstrate safe food handling and preparation techniques that prevent cross contamination from potentially hazardous foods and food groups 8.2.7).

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).
- Prepare breads, baked goods and desserts using safe handling and professional preparation techniques (8.5.10).
- Demonstrate professional plating, garnishing, and food presentation techniques (8.5.12).

Demonstrate principles of food biology and chemistry (9.7)
Supporting Standards:

- Explain the properties of elements, compounds, and mixtures in foods and food products (9.7.1).
- Analyze the effects of thermodynamics on chemical reactions in foods and food products (9.7.2).
- Explain the impact of molecular structure of simple and complex carbohydrates on digestion, nutrition, and food preparation procedures (9.7.4).

Art and Science of Baking and Pastries
Unit 3: Cakes

Students will explore the baking process as it pertains to cakes, with a focus on batter.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• The texture, structure, and overall quality of a cake are influenced by the interaction between the mixing method, the balance of wet to dry ingredients, and the protein content in the flour. By understanding how these factors work together, bakers can control the cake's outcome—whether it's light and airy or dense and moist—enabling them to achieve the desired result in both professional and home baking.	• How does the mixing method, the ratio of wet to dry ingredients, and the amount of protein in the flour determine a cake's outcome?
Students must know:	***Students must be able to:***
• All-purpose flour • Cake flour • Bread flour • Tender • Delicate • Airy • Protein • Gluten	• Bake sponge cakes. • Bake layer cakes. • Differentiate between sponge and layer cakes.

Art and Science of Baking and Pastries
Unit 3: Cakes

Missouri Learning Standards

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).
- Prepare breads, baked goods and desserts using safe handling and professional preparation techniques (8.5.10).
- Demonstrate professional plating, garnishing, and food presentation techniques (8.5.12).

Demonstrate principles of food biology and chemistry (9.7)
Supporting Standards:

- Explain the properties of elements, compounds, and mixtures in foods and food products (9.7.1).
- Analyze the effects of thermodynamics on chemical reactions in foods and food products (9.7.2).
- Explain the impact of molecular structure of simple and complex carbohydrates on digestion, nutrition, and food preparation procedures (9.7.4).

Art and Science of Baking and Pastries
Unit 4: Fillings

Students will explore the baking process as it pertains to fillings, with a focus on custards/creams, mousses, meringues, pie fillings and fruit.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• A filling plays a crucial role in enhancing both the flavor and texture of a baked good.	• What key changes with starch cause thickening to take place in a filling? • How does a filling impact the taste and quality of a baked good?
Students must know:	***Students must be able to:***
• Souffle • Ganache • Pie filling • custards/creams • Mousses • Meringues • Viscosity	• Demonstrate how temperature impacts the product and it's viscosity. • Explain how starch affects the consistency of a filling. • Demonstrate how to bake/cook custard.

Art and Science of Baking and Pastries
Unit 4: Fillings

Missouri Learning Standards

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).

Demonstrate principles of food biology and chemistry (9.7)
Supporting Standards:

- Explain the properties of elements, compounds, and mixtures in foods and food products (9.7.1).
- Analyze the effects of thermodynamics on chemical reactions in foods and food products (9.7.2).

Art and Science of Baking and Pastries
Unit 5: Pastries

Students will explore the baking process as it pertains to pastries, building on their knowledge of fillings, with a focus on doughs, batters, tarts, and pie crust.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• The success of a pastry lies in the balance of technique, ingredients, and temperature control.	• How does a filling complement the taste and quality as it pertains to pastry creation? • How do techniques such as ingredient proportions and temperature control affect the texture, structure, and flavor of a pastry?
Students must know:	***Students must be able to:***
• Pie Crust • Pate A Choux • Puff Pastry • Torte • Tart	• Demonstrate how temperature and technique impact the process and product of baking pastries.

Art and Science of Baking and Pastries
Unit 5: Pastries

Missouri Learning Standards

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).
- Prepare breads, baked goods and desserts using safe handling and professional preparation techniques (8.5.10).
- Demonstrate professional plating, garnishing, and food presentation techniques (8.5.12).

Demonstrate principles of food biology and chemistry (9.7)
Supporting Standards:

- Explain the properties of elements, compounds, and mixtures in foods and food products (9.7.1).
- Analyze the effects of thermodynamics on chemical reactions in foods and food products (9.7.2).
- Explain the impact of molecular structure of simple and complex carbohydrates on digestion, nutrition, and food preparation procedures (9.7.4).

Art and Science of Baking and Pastries
Unit 6: Plating

Students will focus on the impact of plating on peoples' perceptions of taste and quality through a lens of icing, sauces, glazes, and frosting.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• Sweeteners, color, height, texture, size and symmetry enhance the taste and appeal of baked goods.	• How do sweeteners, color, height, texture, size and symmetry enhance the taste and appeal of baked goods?
Students must know:	***Students must be able to:***
• Sweeteners • Texture • Symmetry • Icing • Glaze • Sauces • Frosting	• Explain how the appearance of a baked good impacts how people think it tastes. • Explain how the appearance of a baked good impacts peoples' beliefs about the product's quality. • Demonstrate baked good plating techniques.

Art and Science of Baking and Pastries
Unit 6: Plating

Missouri Learning Standards

Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs (8.5)
Supporting Standards:

- Demonstrate professional skills in safe handling of knives, tools, and equipment (8.5.1).
- Demonstrate knowledge of portion control and proper scaling and measurement techniques (8.5.3).
- Demonstrate professional plating, garnishing, and food presentation techniques (8.5.12).