**Appendix 1**

**Teacher Notes** (not for students)

**Backing Background Information**

Reading a recipe

|  |  |
| --- | --- |
| **Abbreviation** | **Amount** |
| tsp. | Teaspoon |
| Tbsp. | Tablespoon |
| c. | Cup |
| pt. | Pint |
| qt. | Quart |
| g | Gram |
| ml | Milliliter |
| lt | Liter |
| oz. | Ounce |
| fl.oz | Fluid ounce |
| lb. | Pound |
| kg | kilogram |

* Adjusting a recipe
* Professional recipes are done by weight, not volume.
* Recipes are adjusted by weight ratios.
* Use the original recipe to determine the ratio of each ingredient to the flour.
* To double the recipe, double the amount of flour and then calculate the other ingredients based on the ratios in the original recipe.
* Sensory evaluation
  + Carbohydrates enhance flavor and sweetness through carmelization
  + Proteins contribute to browning of foods.
  + Proteins can contribute bitterness, sweetness, and flavors
  + Fats contribute flavor to foods
  + Fats contribute to mouth feel
  + Fats can cause rancidity
* Food Labeling requirements
  + Ingredients are listed in descending order based on weight
  + Nutrition labeling is required for any food that has ingredients added or that makes a nutritional claim
  + Must include the percentages of the US Recommended Daily Allowances (U.S. RDA)
  + Must include serving size, calories per serving, grams of protein, carbohydrate and fat per serving, and percent of RDA for protein, 5 vitamins, and 2 minerals
  + Use appropriate definitions:
    - Free – the product contains no amount of (or trivial) the chosen component – fat, saturated fat, cholesterol, sodium, sugars, or calories.
    - Low – used on foods that can be eaten frequently without exceeding dietary guidelines for fat, saturated fat, cholesterol, sodium, sugars, or calories
    - High – if the food contains 20 percent or more of the daily value for a nutrient in one serving
    - Good Source – one serving of the food contains 10-19% of the daily value for a nutrient
    - Reduced – a nutritionally altered product contains at least 25% less of a nutrient or of calories than the regular or preference product. This claim cannot be made if the reference food already meets the requirements for a “low” claim.
    - Less – a food contains 25% less of a nutrient or of calories than the reference food
    - Light – Either: 1) 1/3 fewer calories or ½ the fat of the reference for, 2) the sodium content is at least reduced by 50% from the low-calorie or low-fat food, or 3) “light in sodium” if there is at least a 50% reduction in sodium
    - More – a serving of food contains a nutrient that is at least 10% of the Daily value more than the reference food.
    - Healthy – low in fat and saturated fat and certain amounts of cholesterol and sodium.
    - Fresh – food that is raw or unprocessed, never frozen or heated, and contains no preservatives
* Changes caused by baking
* Proteins coagulate – they are transformed from liquids to solids
  + Eggs & wheat protein (gluten) in the cookies
* Starches gelatinize – absorb water, swell, and soften
  + Flour absorbs moisture from water, eggs & milk which firms and dries the cookie from 150-212F.
  + Gluten provides structure to the baked good so there are not many good substitutes.
* Sugars caramelize – darken and change flavors
  + Maillard reaction – many sugar breaks down in the presence of proteins. Honey, because of its fructose content, will get browner than other sugars through the maillard reaction.
  + Sucrose browns at 330F – this is carmelization, not maillard reaction
* Water solubalizes ingredients, evaporates, and creates drying
* Fats melt – soften and melt. Butter creates more spread when it bakes while shortening makes a puffier cookie because it has no water. Lard does not cream well so it is difficult for baking. Margarine is more like shortening than like butter.
  + Baking is the process of surrounding food with dry, heated air in a closed environment; heat is transferred by convection and penetrates the food by conduction; the surface of food is dehydrated and caramelizes.

**Cookie Characteristics Related to Ingredients and Baking**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Texture** | **Fat** | **Sugar** | **Liquid** | **Flour** | **Size/Shape** | **Baking** |
| Crispness | High | High (granulated) | Low | Strong | Thin | Well done; cool on a baking sheet |
| Softness | Low | Low (hygroscopic) | High | Weak | Thick | Parchment lined pan, under bake |
| Chewiness | High | High (hygroscopic) | High | Strong | Not relevant, use chilled | Under bake, chill on rack |
| Spread | High | High (coarse granulated) | High (especially eggs) | Weak | Not relevant, use room temperature | Greased pan, low temperature |

Ingredient substitutions

* Sucrose
  + Natural sweeteners – date sugar/syrup, honey, maple sugar/syrup, agave, stevia
    - Higher in liquid so must adjust other ingredients
* Non-nutritive sweetner – only sweeten, no nutritional value, may not brown and will not cream butter well. No Maillard reaction.
  + Saccharin – Sweet’N Low, Sweet Twin, saccharin
    - No calories
    - 200-700 times sweeter than sugar
    - Bitter aftertaste
  + Aspartame – NutraSweet, Equal,
    - 180-200 times sweeter than sugar
    - Cannot be used in cooked foods
    - People with Phenylketonuria cannot tolerate it
* Fat
  + Many recipes can be reduced by 20-30% without significant negative results
  + Can substitute olive oil for butter for less saturated fats but does not reduce fat
  + Nut oils will work in some recipes
  + Cream cheese can be used to reduce fat
  + Margarine reduces saturated fat but not calories
    - Fat-free margarine does not perform well in baked goods
  + Commercial products – Olean, Simplesse, caprenin, salatrin, and oatrim – are not available to home cooks
* Eggs
  + Can substitute egg whites for whole eggs (2 egg whites = 1 whole egg)
  + Include some whole eggs for color and texture