Southern Cayuga Central School District – Curriculum Map

Subject: **Cooking with Chemistry** School Year: 2022 - 2023

Title or Topics w/ NYS Standards	Essential Questions & Vocabulary	Content Skills (Activities to cover Essential Questions)	Major Assessments (Tests, Project, etc.)	Time Frame
Matter Classification & Phases HS-PS1-1	1. What is matter? 2. How is matter classified/ categorized/ grouped? 3. What are the phases/states of matter and their properties? 4. What is the difference between "physical" and "chemical" (in terms of mixtures, changes, properties)? Vocab: Matter, atom, element, pure substance, compound, molecule, mixture, homogeneous, heterogeneous, physical change, chemical change	Matter categorization Food-specific examples for compounds and mixtures Matter Classification Diagram Law of Conservation of Matter	-Phase Transitions Lab (using water and ice) -Quiz -Exam	3-4 weeks

2022-2023

Properties of Water Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
HS-PS1-2	1. What are some special properties of water? 2. What role does water have in solutions? 3. How can I determine the concentration of a solution? 4. What role does water have in food science? Vocab: Quantitative, qualitative, polarity, solubility, vapor pressure, boiling point, freezing point, melting point, condensation point, solution, solvent, solute, colloid, suspension, emulsion, “universal solvent”	-Qualitatively and quantitatively describe the properties of water such as polarity, solubility, vapor pressure, boiling point, and freezing point. -Quantitatively describe concentration of solutions. -Differentiate between solutions, colloids, suspensions, and emulsions - and discuss their applications to food science.	-Water testing exercises -Quiz -Exam	4-5 weeks

2022-2023

Acids, Bases, pH in Food & Drinks Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
HS-PS1-7	1. What is the difference between an acid and a base? 2. What are typical acidity levels in various food and food-adjacent products? 3. What are some acids, bases, and salts used in (and after) cooking? Vocab: Acid, base, Arrhenius, Bronsted-Lowry, pH, pOH, acidity, neutralization, titration, amphoteric, conjugate, litmus	Acids Bases (both definitions) Neutralization Reactions pH - simple calculations & identifications Baking soda as an amphoteric compound	-Litmus Paper tests -Neutralization Reaction Lab -Quiz -Exam	4-5 weeks

2022-2023

Food Digestion & Parts of Food Standards:	**Essential Questions & Vocabulary [Vocab terms are bolded]**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
HS-LS1-7 HS-LS2-3 HS-PS1-4	1. Which parts of **digestion** are chemical, and which parts are physical? 2. How does **metabolism** work? 3. How do human **respiration** and **circulation** tie into digestion? 4. How do drinking water & eating help to regulate body temp, cell activity & maintenance, and general **homeostasis**? 5. What are the **macromolecules** in food? What are their roles, and what are they made of?	A journey through the human digestive system Chemical reactions inside the body related to food **Carbohydrates** **Proteins** **Fats** **Vitamins**	-Modeling Project: Macromolecules -Quiz -Exam	10-12 weeks

2022-2023

Cooking Methods & Reactions Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
HS-PS1-6 HS-PS3-3 HS-PS1-5 HS-LS2-5	1. What's the difference between conventional ovens, convection ovens, and microwave ovens? 2. How can you safely cook/prepare food? 3. What chemical reactions occur during cooking processes? 4. How do I write a recipe that others can easily follow? 5. What are signs of food spoilage?	Crystallization Emulsification Baking Sauteing Deep-frying Air-frying Microwaving Recipe design (a la experiment devising) Food spoilage (the bad, like rotting to inedibility, and the good, like yogurt/cheese/bread) Other cooking & prep methods	*Note: The vast majority of hands-on projects/labs will involve cooking methods, once a baseline of chemical knowledge has been established. Much will depend on ability to reserve proper facilities. -Some experiments in which the results cannot be eaten -Some cooking processes in which the results *can* be eaten -Quiz -Exam -Presentation	8-12 weeks

2022-2023

Food/Cooking "Trends" Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
HS-ESS3-4	1. Why do some people need or want certain culinary specializations / accommodations? 2. Why are these so-called "trends" on the rise, at least in the US? 3. What are some food "trends" in other parts of the world?	Gluten-free cooking Kosher & halal cooking Dairy substitutes Vegan cooking Sustainability practices in food prep	-Research project -Quiz	2-4 weeks

Factors in this curriculum, especially order of content, time spent, and lab/project titles, are all subject to change.