The Edible World-Course Syllabus


Daily Warmup: List one thing you learned from yesterday and one question you still have.

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### Week 1: The Chemistry of Food

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<th>Daily Topic</th>
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| Day 1: Introduction | • Introduction to The Edible World  
• CTY Honor Code  
• CTY Technology Acceptable Use  
• Laboratory Safety  
• Topic overview for summer | • Class discussion: What’s in a peep?  
• Concept Map: Honor  
• Lab tour and safety demonstrations  
• Class discussion: “You are what you eat” | None | No lab today | Begin Food Journal project:  
• Keep a daily log of everything you eat for dinner  
• List all ingredients and estimate the amount of carbohydrates, proteins and fats in the meal (as best you are able)  
• Rank the health of the meal on a scale of 1 (not healthy) to 5 (very healthy). Explain your reasoning |
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<td>Day 2: Elements</td>
<td>• Chemistry vocabulary</td>
<td>• Identification of elements in the classroom</td>
<td>Identify in your lunch today a source of each element we discussed in class (calcium, iron, zinc, magnesium, sodium, potassium)</td>
<td>Measure the boiling and freezing point of water when mixed with sugar and salt.</td>
<td>• Post Lab Questions</td>
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<td></td>
<td>• The Periodic Table of the Elements</td>
<td>• Interactive Periodic Table with videos showcasing various elements</td>
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<td>• Continue Food Journal</td>
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<td>• Physical and chemical properties of common elements found in food</td>
<td>• Demonstrations of chemical properties of elements</td>
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<td>• Read Chapter 1 in Van Cleave</td>
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<td>• How to perform an experiment</td>
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<td>Day 3: Compounds and Solutions</td>
<td>• Chemical compounds found in food</td>
<td>• Identify compounds in foods and in the classroom</td>
<td>Identify one mixture in your lunch that is a solution and one mixture that is not a solution</td>
<td>Making rock candy!</td>
<td>• Post Lab Questions</td>
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<td>• Compare compounds to composing elements</td>
<td>• Interactive activity comparing elements and compounds</td>
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<td>• Continue Food Journal</td>
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<td>• Solutions and their composition</td>
<td>• Model chemical bonding and write formulas</td>
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<td>• Saturated and supersaturated solutions</td>
<td>• Advertising analysis of Gatorade</td>
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<td>• Basic chemical bonding</td>
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| Day 4: Chemical Reactions      | • Physical and chemical properties and changes  
  • Law of Conservation of Mass  
  • Balancing chemical equations  
  • Examples of chemical reactions in the production and consumption of food | • T-charts for properties and changes  
  • Chemical equations worksheets and problems  
  • Demonstration of a chemical reaction (“The Fuming Snake”)  
  • List common reactions | Identify at least one chemical reaction involved in the preparation of today’s meal. | Fermentation in yeast: testing for CO₂ with limewater and measuring gas production in a balloon | • Post Lab Questions  
  • Continue Food Journal |
| Day 5: Acids and Bases (Session 2 only) | • Chemical and physical differences between acids and bases  
  • The pH scale  
  • Common household acids and bases in cooking and beyond  
  • Neutrality and neutralization | • List common acids and bases found in food  
  • Read and interpret pH using pH and litmus paper  
  • Demonstrations of reactions (HCl and NaOH; Windex and Phenolphthalein) | Identify at least one acid and one base found in today’s meal. | pH Lab: Measure and compare pH’s of different foods using pH and litmus paper | • Post Lab Questions  
  • Continue Food Journal  
  • Read Chapter 4 in Van Cleave |
# Week 2: Biomolecules and Biochemistry

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<td>Day 6: Protein</td>
<td>• Common proteins in food and in the body and their uses • Vocabulary: amino acids, hydrophilic, hydrophobic, helix • Structure and function of proteins • Protein differentiation • Identification of proteins in food</td>
<td>• Enzyme hot potato with a piece of paper • “Foldit” video game used to determine the correct structure of proteins • Human demonstrations of primary and secondary structure (Twister?) • Chemical testing for protein</td>
<td>Identify all of the sources of protein on your plate today</td>
<td>Protein ID Lab using Biuret solution</td>
<td>• Introduce Capstone project: Food from Around the World • Food Journal • Post Lab Questions • Read Chapter 2 in Van Cleave</td>
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<td>Day 7: Carbohydrates</td>
<td>• Chemistry of carbon (Organic Chemistry) • Sugars and starches in various foods • How does the body use carbs for energy? • Comparison of organic compounds • Health connection: Diabetes</td>
<td>• Molecular modeling using ball-and-stick kits • 3D models of basic carbohydrates • Interactive demonstration of the Carbon Cycle</td>
<td>Identify all of the sources of carbohydrates on your plate today</td>
<td>• Carbohydrate identification lab using Benedict solution and Iodine Tincture • Day 1 of Bread Mold Lab</td>
<td>• Post Lab Questions • Food Journals (Due Tomorrow!) • Capstone Project • Read Chapter 3 in Van Cleave</td>
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<td>Day 8: Fats and Lipids</td>
<td>• Comparison of different kinds of fats in foods • Polarity and solubility of fats and oils • Necessity of fats in a healthy diet • Health connection: Heart Disease</td>
<td>• Writing sample: Position paper on the necessity of fat with presentation • Molecular modeling of lipid molecules • Human demonstration of polarity and non-polarity</td>
<td>Identify and classify all of the sources of fats in today's meal. Are they healthy or not-so-healthy fats?</td>
<td>Lipid identification lab using Sudan IV solution and the brown paper bag test</td>
<td>• Post Lab Questions • Capstone Project</td>
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| **Day 9: Calories and Energy** | • Vocabulary: energy, calories, ATP  
• Understanding calorie reporting on a nutrition fact label  
• Law of Conservation of Energy  
• Photosynthesis and Cellular Respiration | • Balance chemical equations for respiration and photosynthesis  
• Interactive demonstration of the flow of energy through food and digestion  
• Calculate energy content of various foods using a rudimentary calorimeter | Estimate the caloric content for the food you are eating today based on what you know about the items being served. | • Calorimetry: Construct a water-based calorimeter and measure energy transferred by combustion of potato chips, pretzels, and marshmallows  
• Calculate calorie values | • Post Lab Questions  
• Capstone Project  
• Read Chapters 5 and 6 in Van Cleave |
| **Day 10: Vitamins and Minerals** | • Function and necessity of important vitamins and minerals  
• Understanding nutrition fact label information on vitamins and minerals  
• Health Connection: Multivitamins | • Advertising Analysis: Children’s and Adult Multivitamins  
• Reading and understanding a nutrition fact label  
• Calculating vitamin concentration using titration | Attempt to fill your plate with the widest variety of vitamins and minerals as you can | Vitamin C Titration: Measure the Vitamin C concentration in various beverages using pipet titration and calculating a percent error using nutrition fact labels. | • Post Lab Questions  
• Capstone project  
• Read Chapters 7-8 in Van Cleave |
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| Day 11: Food groups and nutrition | - Food Groups and portioning  
- Food pyramid and current models  
- Choosemyplate.gov  
- Identifying calorie content in various foods and reporting about it | - Design a healthy recipe on a reasonable budget  
- Present recipe designs to class  
- Interactive game play using choosemyplate.gov resources | Prepare a lunch using items from all 5 of the choosemyplate.gov food group categories | Bread mold lab Day 2: data collection and analysis | • Post Lab Questions  
• Capstone project  
• Read Chapter 11 in Van Cleave |
| Day 12: Digestion          | - Overview of the human digestive system  
- Digestive system vocabulary and processes  
- Dynamics of diffusion and osmosis  
- Video-Magic School Bus on Digestion | - Digestive system road maps: student designed drawings of digestion with presentation  
- Digestive system slide show tour  
- Demonstrations of diffusion in the small intestine | Think about what happens to the food you eat the second you put it into your mouth | Candy Chromatography: Measure retention factor of M&M candy coatings using coffee filters and qualitative filter paper | • Post Lab Questions  
• Capstone project |
| Day 13: Cells and Cell Processes | - Overview of key components of animal cells and cell processes using CellCraft game | - CellCraft game: constructing a cell and defending it against invaders  
- Mini lab-Water drop on a penny: comparing hydrophobic and hydrophilic | N/A | Diffusion and osmosis: measuring diffusion rates in food coloring and osmotic changes in a French fry | • Post Lab Questions  
• Capstone Project |
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| Day 14: Thermodynamics | • 3 Laws of Thermodynamics  
• Exothermic and endothermic processes in the production and consumption of food  
• Video-Magic School Bus on Heat transfer | • Use thermodynamic principles to make vanilla ice cream  
• Post-Assessment  
• SPEs and course review topics | N/A | Ice Cream Lab: making ice cream in spheres and plastic bags | Capstone Projects due tomorrow! |
| Day 15: Wrap up   | • Continue course wrap up  
• Visit other classes’ final projects as necessary  
• Open house | • Student Capstone project presentations  
• Open house presentations to parents | N/A | N/A | N/A |