## The Edible World: Course Map

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<th>THURSDAY</th>
<th>FRIDAY</th>
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<td>UNIT 2: Taste</td>
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<td>UNIT 2: Taste</td>
<td>UNIT 3: Taste</td>
<td>UNIT 3: Smell</td>
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<td>UNIT 6: Feel</td>
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### UNIT 1: Introduction to Chemistry

#### Day 1

**ESSENTIAL QUESTION**: What is inquiry-based science?

**MORNING SESSION**

1. Introductions
2. Class expectations
3. Introduction to inquiry/nature of science AND Observations: Inquiry Cube
   - Students will MAKE inferences and predictions based on their analysis of an inquiry cube.
4. Inferences AND Writing in the sciences: Writing a Claim, Evidence, Warrant Paragraph
   - Students will CONSTRUCT a claim, evidence warrant argument that PREDICTS the name and numbers present on the bottom of the inquiry cube based on observations.

**AFTERNOON SESSION**

1. Course Pre-assessment (30 min)
2. Lab safety: Safety Scavenger Hunt
   - Students will CREATE a diagram of our classroom that accurately positions safety equipment and essential labware in space.
3. Classifying matter: What’s the matter?
   - Students will CRITIQUE definitions for “matter” that their classmates have CONSTRUCTED based on common examples.

#### Day 2

**ESSENTIAL QUESTION**: What is the smallest unit of matter?

**MORNING SESSION**

1. Models of the atom: Atomic pudding
   - Students will COMPARE and CONTRAST 5 examples of atomic models and EVALUATE each based on the evidence that exists to support each model.
2. Extension: Build your own model of an atom!
   - Students will BUILD their own model of an atom based on a given set of evidence.

**AFTERNOON SESSION**

1. Parts of an atom [electrons, protons, neutrons]: Atoms by number
   - Students will DISTINGUISH between atomic number, mass of an atom, and average atomic mass and use this information to DRAW a simple atomic model of an atom.
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<th>Day 3</th>
<th>ESSENTIAL QUESTION</th>
<th>What do chemical names and symbols tell us about matter?</th>
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| MORNING SESSION | 1. The periodic table of elements: Create a table  
   a. Students will CREATE their own periodic table ORGANIZING elements based on their properties  
   b. Students will PREDICT the properties of the element geranium based on the trends in the periodic table they’ve organized |
| AFTERNOON SESSION | 1. Elements versus compounds: A New Language  
   a. Students will EXAMINE common elements and compounds in order to DECIPHER patterns in the names of elements and compounds |

<p>| UNIT 2: Taste |</p>
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<tr>
<th>Day 4</th>
<th>ESSENTIAL QUESTION</th>
<th>How do we recognize different tastes?</th>
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| MORNING SESSION | 1. Introduction to taste: Taste the Rainbow (Tongue mapping)  
   a. Students will CONSTRUCT a tongue map, identifying what regions of their own tongue taste salty, sour, bitter, sweet and savory compounds  
   b. Students will COMPARE and CONTRAST their own tongue map with others in the class to debunk the “tongue map theory” of taste  
   2. Taste buds, receptors and the brain: Think Taste  
   a. Students will CONSTRUCT a basic definition of taste based on the relationships of taste buds, receptors and the brain |
| AFTERNOON SESSION | 1. Physical properties: You Light Up My Life  
   a. Students will model the function of a neuron and relate it to taste sensation  
   b. Students will COMPARE the physical properties of salty, sour, bitter, sweet and savory compounds based on conductivity |

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<th>ESSENTIAL QUESTION</th>
<th>How are atoms and taste related?</th>
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| MORNING SESSION | 1. Compounds that Ionize in Solution: Sour Sapidity: how the tongue differentiates between salty, sweet, savory bitter and sour foods  
   a. Students will CONDUCT pH tests to differentiate between compounds with different tastes  
   2. Ionic bonding: Technicolor Tastes (Flame tests)  
   a. Students will CONDUCT flame tests in order to identify the metals present in ionic compounds |
| AFTERNOON SESSION | 1. Are you a Super Taster? PTC testing  
   a. Students will CONDUCT a PTC test to determine if they are a “super taster” |

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| MORNING SESSION | 1. Biomolecules – Carbohydrates: Sweet Things are Made of These  
   a. Students will CONDUCT Molisch tests to indentify foods that contain carbohydrates |
### UNIT 3: Smells

#### Day 7
**ESSENTIAL QUESTION:** How can we define flavor?

#### MORNING SESSION
1. **Taste versus Flavor:** Tongue tied  
   - Students will REFINE their definition of flavor based on experimental data

#### AFTERNOON SESSION
2. **Molecular Formulae:** Sniffing Around  
   - Students will HYPOTHESIZE the relationship between smells and chemistry based on analysis of data

#### Day 8
**ESSENTIAL QUESTION:** What does chemistry have to do with smell?  
Can molecules with the same molecular formula have different smells?

#### MORNING SESSION
1. **Structural formula and isomers:** Molecules in Two Dimensions  
   - Students will RELATE the smells of compounds to their structural formulas using data they've collected
   - Students will EXPLAIN why molecules with the same molecular formula may have different smells

#### AFTERNOON SESSION
1. **Functional groups:** Where's the fun  
   - Students will RELATE certain functional groups to certain smell categories

#### Day 9
**ESSENTIAL QUESTION:** How can a molecule be changed into a different molecule by using chemistry?  
What three-dimensional features of a molecule are important in predicting smell?

#### MORNING SESSION
1. **Synthesis and structural formula:** Making Scents  
   - Students will SYNTHESIZE 3 sweet smelling esters from various organic acids and alcohols

#### AFTERNOON SESSION
2. **3D Models of Molecules:** Sorting it out – shape and smell  
   - Students will visually INTERPRET three-dimensional ball-and-stick molecular representations
   - Students will RELATE the overall 3D shape of a molecule to its smell
3. **Receptor Site Theory:** How does the nose know?  
   - Students will CREATE a model explaining how the nose is able to identify different smelling compounds

### UNIT 4: Sight

#### Day 10
**ESSENTIAL QUESTION:** Does color affect our perception of taste?

#### MORNING SESSION
1. **The influence of color on taste perception:** Pop of Color  
   - Students will INVESTIGATE if the coloring of food affects our perception of its taste

#### AFTERNOON SESSION
2. **Separation of synthetics dyes in Kool-aid:** Kool Chromatography  
   - Students will DETERMINE the synthetic dyes present in Kool-Aid using chromatography
3. **Discussion of synthetic food coloring:** Red dye #5
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<tr>
<td><strong>Day 11</strong></td>
<td><strong>ESSENTIAL QUESTION</strong></td>
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<td>How does our body get energy from food?</td>
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| **MORNING SESSION** | 1. Food Pyramid  
   - Students will **CLASSIFY** common foods based on their nutritional content into the major groups of the food pyramid  
   2. Biomolecules: overview  
   - Students will **EXAMINE** the molecular structure of proteins, lipids and carbohydrates and **RELATE** their structure to their physical properties |
| **AFTERNOON SESSION** | 3. Digestive System  
   - Students will **IDENTIFY** the major organs of the digestive system and **DESCRIBE** their function. |
| **Day 12** | **ESSENTIAL QUESTION** |
| | What is the difference between sugar and synthetic sequences?  
Are low fat diets actually good for you? |
| **MORNING SESSION** | 1. Biomolecules and Synthetic Sweetners: Synthetic Sweets  
   - Students **COMPARE** the physical properties of sweeteners in order to **EXPLAIN** the difference between sugar and synthetic sweeteners like Splenda  
   2. Course Evaluation |
| **AFTERNOON SESSION** | 3. Biomolecules and Synthetic Sweetners: Synthetic Sweets Continued...  
   - Students **COMPARE** the physical properties of sweeteners in order to **EXPLAIN** the difference between sugar and synthetic sweeteners like Splenda  
   4. End of Course Exam |

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<td><strong>Day 13</strong></td>
<td><strong>ESSENTIAL QUESTION</strong></td>
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| | What type of soda produces the highest Mentos and soda geyser?  
How can you use household ingredients to make ice cream? |
| **MORNING SESSION** | 1. Mentos and Coke Geyser: Experimental Design  
   - Students will **INVESTIGATE** what ingredient in soda causes the highest Mentos and soda geyser  
   2. Student presentations and visit to I-ROB |
| **AFTERNOON SESSION** | 3. Mentos and Coke Geyser: Experiment  
   - Students will **INVESTIGATE** what ingredient in soda causes the highest Mentos and soda geyser  
   - **Wrap-up** |