

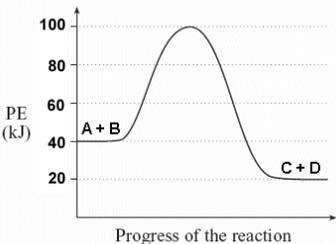
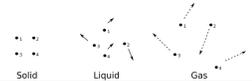
InTASC 6a, b, o, t, v; 7b, k

This evidence looks at how a learning plan is aligned to questions or topics of the unit, along with an engaging learning experience for the students as well as the assessments by which their progress would be measured.

Cookin' Chemistry Standards Alignment
Ustadh Ismail – Chemistry I
Fall 2012

MD Standard	NY Standard	Question/Topic	Lab Experience	Assessment Question
		<p style="text-align: center;">Q: How do we cook our foods?</p> <p style="text-align: center;">T: Conduction, Convection, Radiation</p>	Cooking Popcorn	<p>Which of the following is not a method of heat transfer?</p> <p>a) conduction b) convection c) boiling d) radiation</p> <p>Which of the following describes heat transfer by conduction?</p> <p>a) frying an egg in an iron skillet b) boiling water c) cooking toast in a toaster oven d) sun-drying tomatoes</p> <p>Which of the following describes heat transfer by convection?</p> <p>a) frying an egg in an iron skillet b) boiling water c) cooking toast in a toaster oven d) sun-drying tomatoes</p>
4.3.1.1 – thermal energy is different from temperature	<p>M1.1c – Recognize and convert between scales of measurement</p> <p>4.2b – Temperature is a measure of the average kinetic energy of the particles in a sample of material. Temperature is not a form of energy.</p>	<p style="text-align: center;">Q: How do we measure the amount of heat used to cook our foods?</p> <p style="text-align: center;">T: Temperature</p>		<p>Convert 25 C into K</p> <p>Which of the following statements is true?</p> <p>a) Heat and temperature are the same thing b) Temperature is a measure of the average kinetic energy of particles c) Heat is a measure of the average temperature d) Temperature is just another word for heat</p>

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4.5.1.2 – The student will describe the general types of chemical reactions: combustion	3.2b Types of chemical reactions include synthesis, decomposition, single replacement, and double replacement.	<p>Q: What are safe kitchen practices?</p> <p>T: Combustion</p>	Demonstration: Whoosh Bottle Feynman – “Fire” http://www.youtube.com/watch?v=ITpDrdtGAmo	Temperature tells you: A. the total thermal energy in a sample. B. the average kinetic energy in a sample. C. whether a sample is a solid, liquid, or gas. D. the speed at which the particles in a sample are moving. Kinetic Energy refers to: a) amount of energy an object has due to its motion
4.5.3.1 – The student will demonstrate that adjusting quantities of reactants may affect amounts of products formed: use of coefficients in a balanced equation	3.3.c – A balanced chemical equation represents conservation of atoms. The coefficients in a balanced chemical equation can be used to determine mole ratios in the reaction.		Cooking with natural gas (methane) – barbecue Balancing with color dots http://www.ualr.edu/rebelford/chem1402/q1402/X2/C4/4a_baleq/4a_baleq.htm	The products of a complete combustion of a hydrocarbon are: a) carbon dioxide, water, carbon monoxide and carbon b) carbon dioxide and water c) oxygen and carbon dioxide d) water and carbon monoxide What is the sum of all the coefficients? $___ \text{C}_3\text{H}_8 + ___ \text{O}_2 \rightarrow ___ \text{CO}_2 + ___ \text{H}_2\text{O}$
4.3.3.1 – The student will explain why the interactions among particles involve a change in the energy system: exothermic change 4.3.3.2 – The student will explain why the interactions among particles involve a change in the energy system: endothermic change	4.1b – Chemical and physical changes can be exothermic and endothermic.	T: Exothermic and Endothermic		In exothermic chemical reactions, energy is: a) required to keep the reaction going b) stored in the products of the reaction c) released by the system to the surroundings as the reaction occurs d) absorbed by the system from the surroundings as the reaction occurs Which of the following processes is endothermic? a) freezing water b) cooking an egg c) burning propane gas for cooking Which statement best describes the following equation: $2\text{H}_2 (\text{g}) + \text{O}_2 (\text{g}) \rightarrow 2\text{H}_2\text{O} (\text{l}) + \text{energy}$

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<p>4.3.3.1 – The student will explain why the interactions among particles involve a change in the energy system: exothermic change</p> <hr/> <p>4.3.3.2 – The student will explain why the interactions among particles involve a change in the energy system: endothermic change</p>	<p>4.1c – Energy released or absorbed during a chemical reaction can be represented by a potential energy diagram.</p>	<p>T: Exothermic Diagram</p> <hr/> <p>T: Endothermic Diagram</p>	<p>Demonstration: Elephant Toothpaste</p>	<p>a) A chemical bond is formed and energy is absorbed. b) A chemical bond is formed and energy is released. c) A chemical bond is broken and energy is absorbed. d) A chemical bond is broken and energy is released.</p> <p>Does the diagram below indicate an endothermic or an exothermic reaction?</p> <p>What is the activation energy of this reaction? a) 40 kJ b) 100 kJ c) 20 kJ d) 0 kJ</p> 
<p>4.2.1.3 – water changes density based on phase change (solid, liquid, gas)</p>	<p>3.1kk – Three phases of matter (solids, liquids and gases) have different properties</p>	<p>Q: Why does ice float?</p> <p>Q: How do steam, liquid and ice differ?</p> <p>T: Phases of Water</p>		<p>What is happening in the picture below? a) ice is more dense so it floats b) ice is less dense so it floats c) ice and water have the same</p> <p>Which picture below describes the kinetic energy of water molecules in steam?</p> 
<p>4.3.1.4 – identify melting, freezing, and boiling point on a heating/cooling curve</p>	<p>4.2c – The concepts of kinetic and potential energy can be used to explain physical processes that include: fusion, solidification, vaporization, condensation, sublimation and deposition.</p>	<p>Q: What properties of water allow it to act as a medium for cooking?</p> <p>T: Heating and Cooling of</p>		<p>On the curve below identify the melting point, boiling point and freezing point. (3 Questions)</p>

<p>4.3.1.2 – heating and cooling curves inform us of kinetic energy and organization of particles</p>	<p>4.2a - Thermal energy is associated with the random motion of atoms and molecules.</p>	<p>Water</p>		<p>On the curve below, what happens at the flat line that begins at 100°C? a) Temperature stopped rising and water stopped boiling b) Temperature stopped rising and water began to boil c) Temperature is still rising and water is boiling d) Temperature is still rising and water stopped boiling</p>
<p>MD Standard</p>	<p>NY Standard</p>	<p>Question/Topic</p>	<p>Lab Experience</p>	<p>Assessment Question</p>
	<p>3.1qq – The addition of a nonvolatile solute to a solvent causes the boiling point of the solvent to increase and the freezing point of the solvent to decrease. The greater the concentration of solute particles the greater the effect.</p>	<p>Q: How do we make ice cream? T: Freezing Point Depression</p>	<p>Make Ice Cream</p>	
<p>4.2.1.1 – Water is a bent molecule which leads to its polarity</p>	<p>5.2l Molecular polarity can be determined by the shape of the molecule and distribution of charge. Symmetrical (nonpolar) molecules include CO₂, CH₄, and diatomic elements. Asymmetrical (polar) molecules include HCl, NH₃, and H₂O.</p>	<p>Q: Why does water boil at a high temperature?</p>		<p>What is the shape of a water molecule? a) bent b) linear c) tetrahedral d) none of the above</p>
<p>4.2.1.2 – Polarity of water leads to hydrogen bonding which gives water unique properties (high surface tension, high specific heat)</p>	<p>5.2m – Intermolecular forces created by the unequal distribution of charge result in varying degrees of attraction between molecules. Hydrogen bonding is an example of a strong intermolecular force.</p>	<p>T: Hydrogen Bonding</p>		<p>Which of the following is true about hydrogen bonding? a) the cohesive nature of water makes water have a low boiling point b) water has a higher density when it is solid which allows for ice to float c) water has a relatively high specific heat capacity because of the strength of H₂O bonds that hold H₂O molecules together. d)</p>
<p>4.1.3 – The students will demonstrate how matter may be identified and classified in various ways</p>	<p>3.1w - Elements can be differentiated by their physical properties. Physical properties of substances,</p>	<p>Q: How do you choose cookware? T: Specific Heat/Heat Capacity</p>	<p>Types of frying pans (Einstein cook, pg. 273)</p>	<p>Which of the following would require the least amount of heat to increase in temperature by 50°C? a) copper – specific heat capacity of 0.39 J/g x °C</p>

based upon common properties.	such as density, conductivity, malleability, solubility, and hardness, differ among elements.	T: Different types of metals/alloys	Tomato sauce and aluminum foil (Einstein Cook, pg. 113)	b) water - specific heat capacity of 4.18 J/g x °C c) aluminum - specific heat capacity of 0.90 J/g x °C d) iron - specific heat capacity of 0.47 J/g x °C The heat capacity of a substance depends on: a) temperature only b) mass only c) temperature and mass d) mass and specific heat ----- Which of the following is an alloy? Which type of pan will distribute heat the most evenly?
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MD Standard	NY Standard	Question/Topic	Lab Experience	Assessment Question
4.5.4.2 – Effects of surface area, temperature and concentration on the frequency and energy of molecular collisions (no calculations or specific concentration units)	3.4f – The rate of a chemical reaction depend on several factors: temperature, concentration, nature of reactants, surface area, and the presence of a catalyst.	Q: Why does my sugar dissolve faster if the water is warm? Q: Why do I have to chew food before I swallow it? T: Rates of Reaction		In which scenario would 5 grams of sugar dissolve the fastest in tea? a) use large chunks of sugar in cold tea b) use large chunks of sugar, stir in cold tea c) use small chunks of sugar, stir in hot tea d) use small chunks of sugar, stir in hot tea Which of the following does not influence the rate of a chemical reaction? a) the temperature at which the reaction proceeds b) the concentration of the reactants c) the presence of a catalyst d) the volume of the reaction container
4.2.3.4 – The student will describe the properties of solutions and explain how they form: concentration (dilute, concentrated, supersaturated)	3.100 - A solution is a homogeneous mixture of a solute dissolved in a solvent. The solubility of a solute in a given amount of solvent is dependent on the temperature, the pressure, and the chemical natures of the solute and solvent.	Q: What happens when I mix sugar or salt in my drink?	How much sugar can fit in my cup of water?	What is a supersaturated solution?
4.2.2.2 – The student will explain why organic compounds are so numerous and diverse:		Q: What is in our foods? T: Intro to Lipids, Carbs, Proteins	Macromolecule lab/Chicken Box Nutrition Labels	

<p>ability of carbon to form chains and make rings (recognize, but not produce structural formulas)</p>	<p>3.1gg – Hydrocarbons are compounds that contain only carbon and hydrogen. Saturated hydrocarbons contain only single carbon-carbon bonds. Unsaturated hydrocarbons contain at least one multiple carbon-carbon bond.</p>	<p>Q: Why are unsaturated fats healthier for you?</p>	<p>Types of butter Chicken Box Statistics</p>	<p>What is the structure of a fatty acid? Which of the following is the structure of an polyunsaturated fat? Why are unsaturated fats healthier for you than saturated fat?</p>
	<p>3.1ff - Organic compounds contain carbon atoms which bond to one another in chains, rings, and networks to form a variety of structures. Organic compounds can be named using the IUPAC system.</p>	<p>Q: What are sugars made of?</p>	<p>Create Sugar Crystals (Rock Candy)</p>	<p>What is the building block of all sugars? a) glucose b) lipids c) nucleic acids d) sucralose What type of bond is formed between sugar molecules? a) peptide bond b) sulfur bridges c)</p>
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<p>BIOLOGY 3.1.1.4 – The student will be able to describe the unique characteristics of chemical substances and macromolecules utilized by living systems: proteins</p>	<p>3.1hh - Organic acids, alcohols, esters, aldehydes, ketones, ethers, halides, amines, amides, and amino acids are types of organic compounds that differ in their structures. Functional groups impart distinctive physical and chemical properties to organic compounds.</p>	<p>Q: What happens to my food as it cooks? T: Amino Acids and Proteins</p>	<p>Cooking Eggs</p>	<p>The sequence of amino acids in a protein determines: a) the primary structure b) secondary structure c) tertiary structure d) its peptide bonds Denaturation of proteins is caused by changes in: a) the primary structure of the protein b) the tertiary and secondary structures of the protein c) peptide bonds holding amino acids together d) chemical content of the proteins Denaturation of proteins can be brought about by: a) increasing the temperature of the protein b) adding an acid to the protein c) both a and b d) neither a nor b</p>

<p>4.2.4.4 – The student will differentiate among acids, bases, and salts based on their properties (salts – definition)</p>	<p>5.2h - Metals tend to react with nonmetals to form ionic compounds. Nonmetals tend to react with other nonmetals to form molecular (covalent) compounds. Ionic compounds containing polyatomic ions have both ionic and covalent bonding.</p>	<p>Q: What is salt made of? Q: How can I make meat juicier?</p>		<p>Which of the following would be considered a salt compound?</p>
<p>4.4.1.1 – The student will illustrate that substances can be represented by formulas: subscripts</p>	<p>3.1cc – A compound is a substance composed of two or more different elements that are chemically combined</p>	<p>Q: What do the names on food/beverage labels refer to?</p>		<p>What is the ratio of carbon atoms to hydrogen atoms in Palmitic Oil (Olive Oil): $C_{16}H_{32}O_2$?</p>
<p>4.4.1.2 - The student will illustrate that substances can be represented by formulas: symbols</p>				<p>(Coke) What is the chemical symbol for carbon dioxide?</p>
<p>4.4.1.3 - The student will illustrate that substances can be represented by formulas: write formulas</p>				<p>What is the formula for sodium hydroxide? a) NaOH b) Na(OH)₂ c) S(OH) c) S(OH)₂</p>
<p>4.4.1.4 – The student will illustrate that substances can be represented by formulas: name compounds</p>				<p>What is the name of the following compound: CuCl₂</p>
		<p>Q: What cooking fuels do we use and how does our body use the food we eat? T: Calorimetry/CALORIES/Fats and Sugars</p>	<p>http://www.youtube.com/watch?v=ZMsW2oXors8</p>	<p>The amount of heat needed to raise the temperature of one gram of a substance by 1 degree Celsius is: a) its heat of fusion b) its heat of vaporization c) its 1 calorie d) its specific heat capacity</p> <p>What is the relationship between a calorie and a food Calorie?</p> <p>Which statement is false? a) fats are used by the body to store long-term energy b) sugars are used for quick energy c)</p>

MD Standard	NY Standard	Question/Topic	Lab Experience	Assessment Question

4.5.1.4: The student will describe the general types of chemical reactions: double displacement	3.2b Types of chemical reactions include synthesis, decomposition, single replacement, and double replacement.	Q: How do I make the perfect pancakes, cookies and muffins? T: Types of Reactions/Chemical Leavening	Cooking Pancakes	Which product of this reaction between vinegar and baking soda allows for foods to have a “fluffy” texture to them? $\text{CH}_3\text{COOH} + \text{NaHCO}_3 \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O} + \text{CO}_2$ a) CH_3COOH b) CO_2 c) H_2O d) NaHCO_3
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