Garden Grove Unified School District
Office of Secondary Education
Department of 7-12 Instructional Services

Chemistry

7-12 Science Constructing Meaning Functions Scope and Sequence

This chart reflects the dominant and supportive language functions for production

	Elaboration/ Description*	Compare and Contrast*	Sequencing*	Proposition and Support* (Problem/Solution)	Cause and Effect*
7 Life Science	**Introduced** Q1 & 3, Q2 & 4	**Introduced** Q 1 & 3, Q2 & 4	**Introduced** Q1 & 3, Q2 & 4	**Introduced** Q2 & 4	**Introduced** Q2 & 4
8 Physical Science	**Continued Practice** Q1, Q2, Q3, Q4	**Continued Practice** Q1, Q2, Q4	**Continued Practice** Q1	**Continued Practice** Q1	**Continued Practice** Q1, Q2, Q3, Q4
Biology	**Mastery** Q1, Q2, Q3, Q4	**Continued Practice** Q1, Q2	**Continued Practice** Q1, Q2, Q3	**Continued Practice** Q1, Q3	**Continued Practice** Q1, Q3, Q4
Physical Science (Earth)	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q2, Q3, Q4	**Continued Practice** Q2, Q3	**Mastery** Q1, Q2, Q3, Q4
Chemistry	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q1, Q2, Q3, Q4	**Continued Practice** Q2, Q3	**Mastery** Q1, Q3, Q4
Physics	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q1, Q2, Q3	**Mastery** Q1, Q2, Q3, Q4	**Mastery** Q1, Q2, Q3	**Mastery** Q1, Q2, Q3, Q4

*** The language function of summarizing is to be used throughout the curriculum in conjunction with the other language functions.**

6/23/2010

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CM Functions - Year At-A-Glance

Chemistry	
Quarter	**Dominant and Supportive Functions**
1	Elaboration/Description Compare and Contrast Cause and Effect Sequencing
2	Elaboration/Description Proposition and Support Sequencing Compare and Contrast
3	Compare and Contrast Cause and Effect Elaboration/Description Proposition and Support Sequencing
4	Elaboration/Description Compare and Contrast Sequencing Cause and Effect

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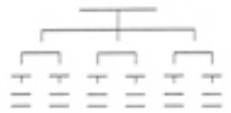
Chemistry: English Learner Support Supplement to Pacing

Quarter 1 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
1a. Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare and Contrast	• Calculate # of neutrons, protons, & electrons. • Make atomic models to compare/contrast atomic # & atomic mass. • Summarize using paragraph summary templates.	**Elaboration/Description** • Atomic number is… • The number of *(protons)* is determined by ____. • The difference between *(atomic number)* and *(atomic mass)* _____.	• **Think-Pair-Share** • **Talking Chips** Using Sentence frames and 1 of the above routines, students define atomic mass and atomic number. Students can also explain how to determine the number of neutrons. • **Clock Appointment** Students are assigned a subatomic particle and they are to find the location of the subatomic particles, charge & location.	**Double Bubble Map** 
1b Students know how to use the periodic table to identify metals, semimetals, nonmetals, and halogens.	Does textbook provide language of dominant function for production? YES or NO	Compare and Contrast **Elaboration/ Description**	• Tree Map Students describe metals, nonmetals, semimetals • Color code periodic table locating metals, nonmetals. Students write a paragraph using a paragraph template to explain the color coding.	**Elaboration/ Description** • ____ are located ___. • Although ____ and ____ have some similar characteristics they are different because… • ____ can be identified as a ___ because ____.	• **Whip Around** Identifying metals, nonmetals. For example, student 1 calls out element and Student 2 identifies whether it's a metal or nonmetal, etc. • **Clock Appointments** metal, nonmetal, semimetal. When appointments made, students say the following to each other at each appointment: I am ____ (metal). I am located ____. My properties are _____.	**Tree Map** 

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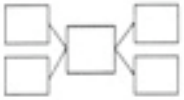
Quarter 1 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
1c Students know how to use the periodic table to identify alkali metals, alkaline earth metals and transition metals, trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Cause and Effect Compare and Contrast	• Color coded periodic table Students write a paragraph using a paragraph template to explain the color coding. • Tree Map Students describe alkali, alkaline earth, halogens using sentence frames. • Element sets- Identify high/low ionization energy, atomic size, electronegativity • Illustrate trends- atomic size • Compare and Contrast trends	**Elaboration/ Description** • _____ is a _____ because it is located ___. • ____ is different from _____ because ____. • ____ trend is different than _____ trend because ____. • _____ has caused _____ which in turn results in _____.	• **Whip Around** Students identify location of alkali metals… • **Think-Pair-Share** Assign students to be an element in the same group or period. Have students tell the other member who has the high or low electronegativity, ionization energy and atomic radius/size.	**Tree Map**  **Double Bubble Map**  **Multi-Flow Map** 
1d. Students know how to use the periodic table to determine the number of electrons available for bonding.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare and Contrast	• Write out electron configurations and identify valence electrons used in bonding. • Atomic models illustrating valence electrons of groups and period	**Elaboration/ Description** • _____ contains _____ valence electrons because ____.	• **Think-Pair-Share** Have partners give electron configurations, checking each other, and identifying valence electrons.	**Circle Map** 
1e. Students know the nucleus of the atom is much smaller than the atom yet contains most of its mass.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description**	• Make a chart to show the masses of the subatomic particles and location of subatomic particles. • Use analogies to compare the size of the nucleus with the size of the atom.	**Elaboration/Description** • One example of _____ is _____. • _____ can be described as _____. • Indicators of _____ are defined as _____. • The nucleus is _____.	• **Talking Stick** Students create analogies and share them with each other using talking Stick	**Circle Map** 

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Quarter 1 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds. 2b. Students know chemical bonds between atoms in molecules such as H_2 , CH_4 , NH_3 , H_2CCH_2 , N_2 , Cl_2 , and many large biological molecules are covalent. 2c. Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.	Does textbook provide language of dominant function for production? YES or NO	Elaboration/ Description **Compare and Contrast**	• Double Bubble Map To have students compare and contrast ionic/covalent bonds. Have students use frames to interpret the maps. • Summarize using sentence structure templates.	**<u>Compare and Contrast</u>** • ____ is different than _____ because ____.	• **Clock Appointments** Each student represents a different element (metal, nonmetal). Discuss what type of bonding occurs between partners and why.	**Double Bubble Map** 
2e. Students know how to draw Lewis dot structures.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Sequencing	• Drawings of various Lewis structures based on given molecules, compounds or ions. Be able to identify the number of electrons for stability and possible bonding pairs. • Ball-stick model	**<u>Elaboration/ Description</u>** • Lewis structures represent_____. <u>Sequencing</u> • To draw Lewis structures, first ___, next ____, then ____.	• **Think-Pair-Share** Students share Lewis structures • **Numbered Heads Together** Groups draw Lewis structures. Teacher calls numbered student to explain structure.	**Circle Map** 

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Quarter 2 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
3b. Students know the quantity one mole is set by defining one mole of carbon 12 atoms to have a mass of exactly 12 grams. **3c**. Students know one mole equals $6.02x10^{23}$particles (atoms or molecules). **3d.** Students know how to determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure. **3e.** Students know how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses	Does textbook provide language of dominant function for production? YES or NO	Elaboration/ Description **Sequencing** Proposition and Support	• Calculations involving conversions from mass to moles or molecules/atoms. • Table illustrating that 1 mole of any elements will have the same # of atoms, but different masses. • Flow chart illustrating steps involved in making conversions. • Lab- HCl with baking soda. • Lab- Have different stations with various samples of graphite, sucrose, table salt, 24K gold and aluminum so students can measure the mass and then calculate the number of molecules/atoms in the sample.	**Sequencing** • First, ____ then ____ and _____. Next _____.	• **Think-Pair-Share** Boss & secretary (students in pairs) where the "boss" dictates to the "secretary" steps to make conversion/calculation. "Secretary" recites it to the class to see if it is correct.	**Flow Map** 

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3a. Students know how to describe chemical reactions by writing balanced equations.	Does textbook provide language of dominant function for production? YES or NO	**Sequencing**	• Identify balanced/ unbalanced equations. • Balance equations • Identify balancing errors	**Sequencing** • Initially ___, then ____. • Prior to _____, _____.	• **Numbered Heads Together** Students given equations to balance, teacher calls a number to get the answer.	**Flow Map** 
7b. Students know chemical processes can either release (exothermic) or absorb (endothermic) thermal energy.	Does textbook provide language of dominant function for production? YES or NO	**Compare and Contrast** Elaboration/ Description	• Comparing concepts map including definitions, graphs, equations, illustrations. • Summarize using paragraph summary templates.	**Compare and Contrast** • _____ and ____ are similar/different because both _____. • While ____ and ____ are both _____, there are several major differences including _____.	• **Think-Pair-Share** Compare and contrast the graphs of endothermic/ exothermic reactions.	**Double Bubble Map** 
7d. Students know how to solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.	Does textbook provide language of dominant function for production? YES or NO	Sequencing **Elaboration/ Description** Proposition and Support	• Calculations using known values of specific heat • Peanut lab analysis and calculations	**Elaboration/ Description** • *(Metals)* have _____specific heat capacities because_____. • *(Specific heat)* can be described as _____. Sequencing • First, _____. Then, ____. Finally, ___.	• **Numbered Heads Together** Teacher presents specific heat problems, students work together to solve and explain steps orally to class.	**Circle Map** 

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7a. Students know how to describe temperature and heat flow in terms of the motion of molecules (or atoms).	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare and Contrast	• Molecular illustration of heat flow direction resulting in change in temperature. Illustrate motion of molecules. • Summarize using sentence structure templates.	**Elaboration/ Description** • _____ can be identified by/described as _____. • _____is illustrated by _____. <u>Compare and Contrast</u> • The difference between heat and temperature is _____.	• **Think-Pair-Share** Students explain hot/cold water demonstration using key terms- heat, temperature, motion of molecules, kinetic energy.	**Circle Map**  **Double Bubble Map** 

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4a. Students know the random motion of molecules and their collisions with a surface create the observable pressure on that surface.	Does textbook provide language of dominant function for production? YES or (NO)	Elaboration/ Description **Cause and Effect**	• Illustration of barometer including molecular representation of atmospheric pressure.	**Cause and Effect** • ____ is caused by ____. • If _____, then _____.	• **Lines of Communication** Teacher provides prompts (explanation of filling tires at molecular level, dangers of heating closed gas tank), students respond using key terms with each other.	**Multi -Flow Map** 
4b. Students know the random motion of molecules explains the diffusion of gases.	Does textbook provide language of dominant function for production? YES or (NO)	**Cause and Effect**	• Tap into student's prior knowledge with diffusion from biology and compare that to how gases diffuse. For example, opening a bottle of perfume on one side of the room and the other side of the room will eventually smell it.	**Cause and Effect** • _____ results in _____ because _____.	• **Think-Pair-Share** Students discuss other examples of how gases diffuse.	**Multi-Flow Map** 

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4c. Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases. 4d. Students know the values and meanings of standard temperature and pressure (STP). 4e. Students know how to convert between the Celsius and Kelvin temperature scales. 4f. Students know there is no temperature lower than 0 Kelvin.	Does textbook provide language of dominant function for production? YES or (NO)	Elaboration/ Description Compare and Contrast Sequencing **Cause and Effect** Proposition and Support	• Demonstrations of gas laws. For example, crushing can, balloon in flask, Magdeberg hemispheres. • Lab where students calculate absolute zero. • Multi-flow thinking map showing how gas laws are applied (cause/effect). • Compare and contrast all the different gas laws. • Calculations with gas laws. • Use individual white boards to identify variables in the gas laws and to show how to solve a problem. • Lab: "Replacement of hydrogen over water by magnesium reaction". Uses concepts of Dalton's Law, Ideal Gas Law and Gas Stoichiometry. Recommend using lab report drafting template.	**Cause and Effect** • _____ has been caused by _____ because _____. • If ____ results in ____, it follows that ____. • When _____ is increased (or decreased) the result is _____.	• **Think-Pair-Share** Students predict what would happen when a variable is changed in one of the gas law equations. • **Talking Stick** To identify the given unknown in order to solve a gas law problem.	**Multi-Flow Map** 

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7c. Students know energy is released when a material condenses or freezes and is absorbed when a material evaporates or melts.	Does textbook provide language of dominant function for production? YES or NO	**Compare and Contrast** Elaboration/ Description Proposition and Support	• Quick demo with students: • Heating of water • Hand on ice cube showing how heat energy flows from hand into the ice cube (direction of heat flow).	**Compare and Contrast** • ____ and _____ are similar because they are both _____. • ____ and ____ are different because _____ is ____ and ___ is _____. • The primary distinction ____ and ____ can be described as _____. • ____ can be described as energy being _____.	• **Think-Pair-Share** Students share what they think/know about the difference in energy changes between condensation and freezing and how it relates to the phase changes.	**Double Bubble Map** 
2d. Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare and Contrast	• Quick demo of boiling water with rice to see the rice grains swirling around in the water. • Show students an ice cube and glass of water and discuss with students why one is a solid and the other a liquid when they're both composed of water molecules. Introduce idea of intermolecular forces and difference in energy between the bonds in a solid versus a liquid.	**Elaboration/ Description** • ____ have/has ____ and is known for ____. • (for example: A solid has strong intermolecular forces and is known for its molecules having minimal random motions compared to a liquid.) Compare and Contrast • The differences in similarity between ____ and _____ are _____. • Although ____ and ____ have some similar characteristics ____ they're very different because_____.	• **Think-Pair-Share** Students state observations that were noticed during the demo, for example motion of molecules. Use the following terms in the discussion: motion, molecules, intermolecular forces, solid, liquid.	**Circle Map** 

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Quarter 3 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
6a. Students know the definitions of solute and solvent. 6d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare and Contrast Sequencing	• Make a Venn diagram (Double Bubble Map) with solute on one side, solvent on the other and solution in the overlap. Give students various solutions to sort. For example, coffee is a solution that goes in the center of the Venn diagram, then identify the solute (which is coffee grounds) and solvent (which is the water). • Calculations of molarity, ppm, % composition with practice worksheets.	**Elaboration/ Description** • ___ is ___ because ____. • Initially ____ then ____. • ____ can be described as _____.	• **Think-Pair-Share** List solutions (coffee). Students identify solute (coffee) and solvent (water). • **Think-Pair-Share** Boss/secretary to identify the solute and solvents, then work together to solve calculations.	**Circle Map**  **Double Bubble Map** 
6b. Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion. 6c. Students know temperature, pressure, and surface area affect the dissolving process.	Does textbook provide language of dominant function for production? YES or NO	Elaboration/ Description **Cause and Effect**	• Demo with food coloring with hot and cold water to see the affects of temperature and molecular motions. • Demo with cubed sugar versus granulated sugar to see the affects of the dissolving process. • Students design an experiment to test the affects on the rate of dissolving solids.	**Cause and Effect** • If ____ then ____. • When ____ is added, _____ dissolves because _____. • ____ causes ____. Which in turn results in _____.	• **Think-Pair-Share** with students explaining why certain factors affect the rate of dissolving. • **Numbered Heads Together** Make a pile of factors that affect the rate of dissolving for students to discuss in a small group or with pairs. They draw one card and elaborate on the factor to discuss whether the factor increases or decreases the rate of dissolving.	**Multi-Flow Map** 

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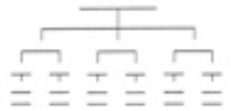
Quarter 3 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
5a. Students know the observable properties of acids, bases, and salt solutions.	Does textbook provide language of dominant function for production? YES or (NO)	Elaboration/ Description **Compare and Contrast**	• Use the Double Bubble Map (thinking map) to compare and contrast acids and bases. • Use a Tree Map (thinking map) to summarize the differences between acids, bases and salt solutions.	**Compare and Contrast** • The majority of ____ are ___ while ____ are ____. • _____ and ____ are different because ____ is ____ and ____ is _____. • _____ is/are ____ and tends to ___. • Characteristics of _____ include ____.	• **Think-Pair-Share** Have students share out examples of acids, bases and salt solutions from everyday household items. • **Lines of Communication** One line of students have an acid or base written on a card that is held above their head. The opposite facing student then lists properties of that acid or base to get the student holding the card to guess what it is based on the properties given from the partner.	**Double Bubble Map**  **Tree Map** 
5b. Students know acids are hydrogen-ion-donating and bases are hydrogen-ion-accepting substances. 5c. Students know strong acids and bases fully dissociate and weak acids and bases partially dissociate.	Does textbook provide language of dominant function for production? YES or (NO)	Elaboration/ Description **Compare and Contrast** Cause and Effect Proposition and Support	• Labeling reactions with acid, base, conjugate acid, conjugate base. • Take out various household items and test them with litmus paper to see which are acids and which are bases. • Quick demo with a conductivity apparatus to test strong and weak acids and bases. • Have students illustrate the difference between a strong/weak acid/base on the molecular level	**Compare and Contrast** • ____ and ____ are different because ____ is ____ and ____ is ____. • Indicators of ____ are ___ and ____. Cause and Effect • Due to the fact that ____, it will _____.	• **Give One Get One** Students share information on different acids and bases. For example, teacher calls out strong acids, so students give one and get one fact about strong acids. Then repeat for weak acid, strong/weak base.	**Double Bubble Map**  **Multi-Flow Map** 

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Quarter 3 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
5d. Students know how to use the pH scale to characterize acid and base solutions.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Proposition and Support	• Calculations involving pH. • Quick demo with litmus paper or pH meter to show pH of various solutions. Examples are household items such as bleach, soap, lemons and soda. • Mini lab with cabbage juice indicator (Textbook pg 578).	**Elaboration/Description** • One example of ___ is ____. • ___ can be described as _____.	• **Numbered Heads Together** Groups of 4 students are given a pH calculation and each takes a turn to explain how to solve the problem.	**Circle Map** 

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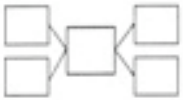
Quarter 4 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
8a. Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time. 8b. Students know how reaction rates depend on such factors as concentration, temperature, and pressure. 9a. Students know how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure. 9b. Students know equilibrium is established when forward and reverse reaction rates are equal.	Does textbook provide language of dominant function for production? YES or NO	Elaboration/ Description **Cause and Effect** Sequencing	• WOC p.596 Figure 17.1. Draw and label figure applying collison model and key terms. • Students will show the cause and effect sequence of changing factors. Ex. ↑ temp ↑ KE ↑collisions ↑bonds break ↑faster rxn • Ex. ↑ reactant conc. ↑collisions ↑bonds break ↑faster rxn • Students can use sequences to create written responses. • Summary- use template, figure 17.1 and sequencing activity to guide summary.	**Cause and Effect** • When _____ (factor) is added _____ (inc./dec. collisions) occurs resulting in _____ (inc./dec. reaction rate). • As a result of _____(factor), _____ (decreased rxn rate) occurred because _____.	• **Give One Get One** Students write factor on paper. Exchange paper with partners. Partners explain how factor affects reaction rate. Use sentence structure or sequence template to guide student interaction. Students continue to exchange factors.	**Multi-Flow Map** 

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Quarter 4 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
8c. Students know the role a catalyst plays in increasing the reaction rate.	Does textbook provide language of dominant function for production? YES or (NO)	Elaboration/ Description **Cause and Effect**	• Label catalyzed and uncatalyzed reaction pathway- reactants, products, activation energy.	**Cause and Effect** • If _____ (catalyst removed/added), then _____ (rxn rate dec./inc.) Elaboration/Description • _____ (catalyst) can be described as _____. • _____ is illustrated by _____.	• **Numbered Heads Together**	**Multi-Flow Map** 
11a. Students know protons and neutrons in the nucleus are held together by nuclear forces that overcome the electromagnetic repulsion between the protons.	Does textbook provide language of dominant function for production? (YES) or NO	**Elaboration/ Description**	• Write a summary describing how protons and neutrons in the nucleus are held together by nuclear forces (use a summary template).	• Components of _____ include _____. • _____ can be described as _____.	• **Give One Get One** Use this strategy to have students share their summaries with each other.	**Circle Map** 
11b. Students know the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions. The change in mass (calculated by $E = mc^2$) is small but significant in nuclear reactions.	Does textbook provide language of dominant function for production? (YES) or NO	**Elaboration/ Description** Compare and Contrast	• Write a summary contrasting how energy is released during nuclear fussion reactions vs. chemical reactions (use a summary template).	• Both _____ and _____ do _____. • However, _____ is different from _____ because _____.	• **Give One Get One** Use this strategy to have students share their summaries with each other.	**Double Bubble Map** 

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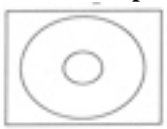
Chemistry: English Learner Support Supplement to Pacing

Quarter 4 Standards	**Functions for Production** (Bold denotes dominant function)		**Sample Products**	**Sentence Frames**	**Structured Oral Language Practice Routine(s)** (CM Binder Tab 3)	**Correlating Thinking Map(s)**
11d. Students know the three most common forms of radioactive decay (alpha, beta, and gamma) and know how the nucleus changes in each type of decay. 11c. Students know some naturally occurring isotopes of elements are radioactive, as are isotopes in nuclear reactions. 11e. Students know alpha, beta, and gamma radiation produce different amounts and kinds of damage in matter and have different penetrations.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description** Compare/Contrast	• Identify decay type given various equations. Highlight particles. • Complete equations to balance decay equations- identify decay type. • Discuss medical uses of decay products. • Chemistry explorers WOC p. 672. Mini research or discussion relating Marie Curie's work to chapter. What elements researched? Why are elements radioactive? What risks involved with her research? What was her fate? Would you pursue her research?	**Elaboration/Description** • _____ (decay type) is illustrated by _____. • Indicators of _____ (decay type) are defined by _____ (change in mass number and atomic number)	• **Lines of Communication** Line 1 contains nuclides. Line 2 contains type of decay. Students collaborate to complete equation. • **Think-Pair-Share** Personal connection to life and death of Marie Curie. What risks involved with her research? What was her fate? Would you pursue her research? How would you protect yourself against radiation?	**Circle Map** 

Garden Grove Unified School District
Office of Secondary Education
Department of 7-12 Instruction

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10a. Students know large molecules (polymers), such as proteins, nucleic acids, and starch, are formed by repetitive combinations of simple subunits. 10b. Students know the bonding characteristics of carbon that result in the formation of a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules. 10c. Students know amino acids are the building blocks of proteins.	Does textbook provide language of dominant function for production? YES or NO	**Elaboration/ Description**	• Activity- create monomer of any type of polymer. Locate other students with same monomers to create larger polymers. • Tree map- polymers, types of polymers, subunits of polymers, location, properties. • Build ball and stick models of amino acids. Students can join 2 amino acids to show dipeptide and peptide bond. Lengthen chain produce polypeptide. Students use frames to interpret their models.	**Elaboration/Description** • One example of (polymer) _____ is _____ (protein). _____ can be described as _____. • Characteristics of (polymer) _____ include _____ and _____.	• **Think-Pair-Share** Students use sentence structures. Each student choose 1 polymer to share. • **Clock Appointment** make appointment with each polymer type. Orally discuss similarities and differences between polymers. Use questions to supplement oral responses.	**Tree Map** 

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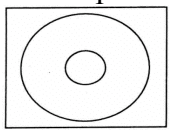
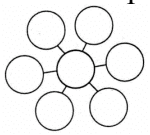
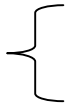
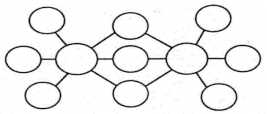
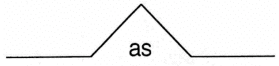
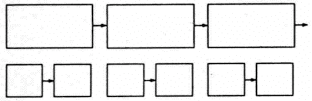
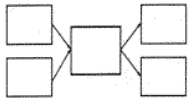
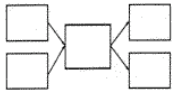
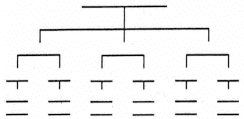
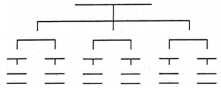
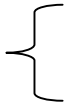
Constructing Meaning Functions and Thinking Maps

The chart below shows the alignment between the dominant language functions (Systematic ELD and Constructing Meaning) and the eight Thinking maps. Aligning the two will support English Learners in their receptive and expressive language acquisition.

Language Function	Language Function	Thinking Map
Elaboration/ Description	Defining content and text Describes attributes, qualities, characteristics and properties Explain relationships of objects in space Comparing whole to parts Analysis of text	Circle Map  Bubble Map  Brace Map 
Compare/ Contrast	Compare and Contrast Understand and express how two or more things are similar and how they are different Understand and express the relationship between two ideas, concepts, or things	Double-Bubble Map  Bridge Map 
Sequencing	Sequencing and ordering Relate steps in a process Express time relationships and actions within a larger event	Flow- Map 
Cause-Effect	Cause and Effect Explain the cause of an outcome Explain why something occurred	Multi-Flow Map 
Proposition and Support	Defend an opinion Explain reasoning, or justify a position Classifying and sorting	Multi-Flow Map  Tree Map 
Summarizing	Express main ideas and significant details	Tree Map  Brace Map  Circle Map