CCPS Science Unit Plan

Grade	**10-12**	**Subject**	**Chemistry**	**Unit #**	**2**
Unit Name	**Chemical Bonding and Reactions**		**Timeline**	**6 weeks**	
How to use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding all abbreviations used with this framework.				
Unit Overview	**This unit focuses on interactions between atoms and molecules, relating properties to strength and type of intermolecular and intramolecular forces, molecular structure and function of materials, and bonding (configurations and naming compounds).** **An atom is the smallest unit of matter that retains all of an element's chemical properties. Atoms combine to form molecules, interacting to form solids, gases, or liquids. For example, water is composed of hydrogen and oxygen atoms that have combined to form water molecules. Many biological processes are devoted to reassembling molecules into different, more useful molecules.**				
Lesson Plan guidance document and template	**CCPS Lesson Plan Template Day View** **Lesson Plan Template Week View** **Department of Science Guidance Document**				

3Dimensional Instruction

GSE	Science and Engineering Practices	Crosscutting Concepts
SC2. Obtain, evaluate, and communicate information about the chemical and physical properties of matter resulting from the ability of atoms to form bonds. a. Plan and carry out an investigation to gather evidence to compare the physical and chemical properties at the macroscopic scale to infer the strength of intermolecular and intramolecular forces. c. Construct an explanation about the importance of molecular-level structure in the functioning of designed materials. Clarification statement: Examples could include why electrically conductive materials are often made of metal, flexible but durable materials are made up of long chained molecules, and pharmaceuticals are designed to interact with specific receptors.) d. Develop and use models to evaluate bonding configurations from nonpolar covalent to ionic bonding.	• **Asking questions and defining problems** • **Developing and using models** • **Planning and carrying out investigations** • **Constructing explanations and designing solutions** • **Engaging in argument from evidence Obtaining, evaluating, and communicating information**	• **Energy and Matter** • **Stability and Change** • **Patterns**

	(Clarification statement: VSEPR theory is not addressed in this element.) e. Ask questions about chemical names to identify patterns in IUPAC nomenclature in order to predict chemical names for ionic (binary and ternary), acidic, and inorganic covalent compounds. f. Develop and use bonding models to predict chemical formulas, including ionic (binary and ternary), acidic, and inorganic covalent compounds **SC3.** Obtain, evaluate, and communicate information about how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions. a. Use mathematics and computational thinking to balance chemical reactions (i.e., synthesis, decomposition, single replacement, double replacement, and combustion) and construct an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. b. Plan and carry out an investigation to determine that a new chemical has been formed by identifying indicators of a chemical reaction (e.g., precipitate formation, gas evolution, color change, water production, and changes in energy to the system). c. Use mathematics and computational thinking to apply concepts of the mole and Avogadro's number to conceptualize and calculate • percent composition • empirical/molecular formulas • mass, moles, and molecules relationships • molar volumes of gases d. Use mathematics and computational thinking to identify and solve different types of reaction stoichiometry problems (i.e., mass to moles, mass to mass, moles to moles, and percent yield) using significant figures. (Clarification statement: For elements c and d emphasis is on use of mole ratios to compare		

	quantities of reactants or products and on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.) e. Plan and carry out an investigation to demonstrate the conceptual principle of limiting reactants.		

NGSS Alignment	**NGSS Alignment to Disciplinary Core Ideas**

Weekly Lesson Tasks

Week 1					
GSE: SC2.d,e,f		**Focused Concept:** • **Bonding Configurations/Lewis diagrams** • **Bohr Models**			
Phenomenon: Daily Phenomenon are found in the opening			**DQ: What bonds are present? How do they affect the properties of a substance?**		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Learning Target	**SWBAT** explain how ions are formed. **SWBAT** identify cations and anions. **SWBAT** use the periodic table to predict the valence electrons of atoms. **Focus question:** How do you differentiate between a molecule, an atom, and an ion?	**SWBAT** use the criss-cross method to form chemical compounds. **Focus question:** How do you write the formula of a nitride, nitrate, and nitrite?	**SWBAT** describe how covalent bonds are formed and draw the structures examples. **Focus question:** When does the breaking of chemical bonds release energy?	**SWBAT** explain how the arrangement of bonding and nonbonding electron pairs influences the shape of a molecule. **Focus question:** How can you predict the molecular shape of a compound?	**SWBAT** describe formation of cubes. **Focus question:** How are cubes formed?

Opening	• TTW show the phenomenon. • TTW Use the See-Think-Wonder protocol to guide student thinking. • TTW ask students: How can understanding chemical bonding and reactions support fire safety? What do you see? What do you think about what you are seeing? What does it make you wonder? • TTW provide students opportunities to share observations and develop questions. • TTW record students' questions to direct instruction. Based on the guiding question, ask students to generate claims for the focus question.	• TTW show the phenomenon. • TTW Use the See-Think-Wonder protocol to guide student thinking. • TTW ask students: How can understanding chemical bonding and reactions support fire safety? What do you see? What do you think about what you are seeing? What does it make you wonder? • TTW provide students opportunities to share observations and develop questions. • TTW record students' questions to direct instruction. Based on the guiding question, ask students to generate claims for the focus question.	• TTW show the phenomenon. • TTW Use the See-Think-Wonder protocol to guide student thinking. • TTW ask students:Why water expands when it freezes? What do you see? What do you think about what you are seeing? What does it make you wonder? • TTW provide students opportunities to share observations and develop questions. • TTW record students' questions to direct instruction. Based on the guiding question, ask students to generate claims for the focus question.	• TTW show the phenomenon. • TTW Use the See-Think-Wonder protocol to guide student thinking. • TTW ask students: What do you see? What do you think about what you are seeing? What does it make you wonder? • TTW provide students opportunities to share observations and develop questions. • TTW record students' questions to direct instruction. Based on the guiding question, ask students to generate claims for the focus question.	• TTW show the phenomenon. • TTW Use the See-Think-Wonder protocol to guide student thinking. • TTW ask students: What do you see? What do you think about what you are seeing? What does it make you wonder? • TTW provide students opportunities to share observations and develop questions. • TTW record students' questions to direct instruction. Based on the guiding question, ask students to generate claims for the focus question.
Guided Practice/ Transition (20 minutes) **Key Vocabulary** Chemical bond Ionic bond Covalent bond Metallic bond Valence electrons	**TTW** review electron configuration and identifies valence electrons. **TTW** explain the types of ions using IONS AND MOLECULES presentation. **TTW** differentiate between atoms, molecules, and ions to determine the valence electrons.	**TTW** ask: What happens during the criss-cross dance? **TTW** pause the video at criss-cross 1:13 secs. CHA CHA DANCE **TTW** use direct instruction to provide information about ionic compounds. **TTW** review Ions/Ionic Compounds notes	**TTW** explain covalent bonding using the PowerPoint. COVALENT BOND NOTES. **TTW** model #s 1 & 2 on slide 48 with the class. **TSW t**ake notes in their notebooks on the Lewis dot structure for covalent bonding using the chart**.**	**TTW** use PowerPoint to explain the different geometry of compounds using valence electrons to introduce the content to the students. MOLECULAR STRUCTURE **TTW** explain using the example on pg. 214, the Lewis structure for formaldehyde, and pg. 224 example problem 7.	**TTW** review module 6 on pp. 192 to explain the concept of metallic bonds and the properties of metals**.**

Cation Anion		**TTW** provide direct instruction for naming Ionic Compounds. **TTW** show a video Naming Ionic Compounds **TTW** pause the video while showing it and ask higher order thinking questions, and engage in discussion of the topic.	**TSW** use a whiteboard to draw the practice problems #s 3 & 4 on slide 48 in groups**.**		
Independent Practice	**TSW work in groups of 3-4 students to complete th POGIL activity on Polyatomic ions** **The teacher should time the sections between the stops of the Pogil to check for understanding (CFU)**	**TSW work in groups of two on ionic compounds CER, create an argument board, and present the findings to the class.** **TTW provide support to student groups by asking probing questions to guide student thinking**	**TSW be given various chemical formulas and asked to draw the Lewis Dot Structure.** **LEWIS DOT STRUCTURE** **TTW divide the class into four groups and assign each group four problems by using hole punch dots.** **Materials: Different color hole punch dots, glue, white paper, and markers.**	**TSW be assigned pivot activity titled "Molecular Shapes with 4 Domains"** **TTW provide support to student by asking probing questions to guide student thinking**	**TSW** research and write a CER : How do crystals to form cubes? **Student groups will collect evidence to answer the guiding question, "Why do some crystals for cubes?" and will complete a CER page 193** **TSW prepare a whiteboard for oral presentations**
Assessment Summary	**TSW use post-it notes to answer the questions on page 183 to demonstrate their understanding of differentiating the ions.**	**TSW complete questions on pp.175 Q#7-11 and pp.183 Q#19-23**	**TSW** compare and contrast the ionic and covalent compound. **Homework: #s** 1-6 on the pg 200.	**TSW explain how the periodic table helps to predict the bonding and structure of molecules and provides an example. TTW provide opportunities for students to share their responses and will clear up misconceptions.**	**TSW be assessed by their CER presentations in group**

Small Group Tasks (TBA)					

Week 2					
GSE: SC3.a,b.	**Focused Concept: Chemical Reactions** • **How do chemical reactions demonstrate the conservation of mass?** • **What role does energy play in determining the outcome of a chemical reaction?** • **What are the signs of a chemical reaction taking place?** • **Chemical Reactions – Types of Reactions; Balancing Equations, Reviewing Nomenclature, Writing Chemical Equations**				
Phenomenon: Daily Phenomenon are found in the opening			**DQ: Ask the students the following questions to drive the lesson:** **What happens to the mass of the reactants during a chemical reaction?** **What happens to atoms and molecules during a chemical reaction?** **How is mass conserved during a chemical reaction?**		
	Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
Learning Target	**SWBAT classify chemical reactions based on their characteristics, such as synthesis, decomposition, single replacement, double replacement, and combustion reactions.** **Focus question:** **How do you predict a product in a chemical reaction?**	**SWBAT write a balanced chemical equation for a reaction** **Focus question:** **How do chemical reactions take place?**	**SWBAT describe chemical reactions using word equations.** **SWBAT identify the correct chemical symbols and formulas to write skeleton equations for chemical reactions.** **Focus question:** **How do you differentiate between a skeleton and a word equation?**	**SWBAT identify the signs of a chemical reaction taking place using STEM case** **Focus question:** **What are the signs that show a chemical reaction has taken place?**	**SWBAT to identify different chemical reaction types (synthesis, decomposition, replacement, double displacement, and combustion), demonstrate examples, and understand the application** **Focus question:** **What are the different types of chemical reactions?**
Opening (10-15 minutes)	**Teachers show the image of the phenomenon. Students will fill out a See-Think-Wonder chart, encouraging them to make careful observations, thoughtful interpretations, and curious inquiries about what they see**	**The teacher shows the phenomenon of cooking food. Ask the question, "What happens to food when you cook it? Students will complete K.W.L.**	**Show the image of the phenomenon and ask the students to explain how chemical reactions are modeled.**	**TTW introduce a phenomenon to generate discussions on electron and chemical reactions**	**TSW use the phenomenon to answer the question," How is the food being cooked?** **Students use see think wonder to respond to the question**

Guided Practice/Transition to Work Session (20 minutes) **Key Vocabulary:** **Single Replacement** **Double Replacement** **Combustion** **Synthesis** **Decomposition**	**TTW assign students in groups of three to work classify reactions on pp. 245 and put them on sticky notes and place them on the white board.** **TTW explain predicting products of a chemical reaction** **TSW write the first slide in their notebooks for guidance to solve the problems.**	**TTW lead the students in explaining the reaction process and equations using the teacher's PPT. REACTIONS AND EQUATIONS PPT** **TSW write down the steps to balance the equations in their notebooks to assist them while solving the problems.** **TTW explain the process of balancing chemical equations using the practice problems on pp. 240 Q# 1-3 along with the students**	**TTW model and demonstrate how to convert worded equations into symbolic equations.** **Use practice problems on the PowerPoint.** **The teacher gives more practice problems on pages 240 and 243**	**The teacher performs demonstrations of chemical reactions and guides the students to observe and write down the signs** **1.$AgNO_3$ (aq) + NaCl)aq)=white ppt** **2.Pd(NO3)2(aq) + KI(aq)=yellow ppt** **3.NaHCO3 (baking soda) + CH_3COOH(vinegar) =gas evolution** **4. (HCl 9aq) + Mg(s) =gas evolution and temperature change detection(exothermic)**	**TTW explain the different types of chemical reactions and the evidence. used to show the chemical reactions** **TSW make a chart in their notebooks to write the general equations for each type of reaction.** **TTW practice slide 6, 16, 19 from powerpoint**
Independent Practice (45-50 minutes)	**TSW work independently on predicting products based on the types of reaction notes** **TTW provide support to student groups by asking probing questions to guide student thinking** **TTW refer to the Powerpoint to provide additional support to students to identify the products of a chemical reactions**	**TSW complete practice problems from the PowerPoint on slide 19 with a partner.** **TTW provide support to student groups by asking probing questions to guide student thinking** **TTW use figure 6 on pp. 244 to provide support to student groups.**	**TSW work on writing word and skeleton equations in their notebooks**	**Students are assigned what changes during a chemical reaction activity on pivot interactive.** **The teacher checks the students' responses on the pivot for mastery by circulating the room and providing opportunities for reteaching when needed.**	**TSW work on the CCC in groups of three on pp. 246** **The TSW study analyzes the five types of reactions and create a poster which includes answers to the following questions: Identify similarities and differences between the reactions, how the similarities and differences could be used to classify the reactions, and what patterns are unique to each reaction.** **Student groups will then engage in a gallery walk, visiting other posters and providing feedback to their peers.**

Assessment/Summary (5-10 minutes)	**The teacher assigns a Classifying Chemical Reactions science notebook online on an ebook**	**Students will conduct a think-pair-share to explain how the Law of Conservation of Mass applies to balancing chemical equations**	**As a ticket out the door, students work on the Parts of a chemical reaction to label the different parts.**	**TTW reteach/remediate/enrich the concept if required TSW practice problems on pp.243 Q#4-6 and the**	**TSW write a paragraph on the real-world connection on pp. 246 on the case study TSW answers the Get It? on pp. 249 for content mastery while the teacher reviews the topic for the day**
Small Group Tasks (TBA)					

Week 3					
GSE: SC3.c,d,e	• **Focused Concept: Moles and Stoichiometry** • **The Mole – Moles/Representative Particles, Moles/Mass, Mass/Representative Particles, Molar Mass, Percent Composition** • **Stoichiometry – Mole A/Mole B, Mass A/Mole B, Mass A/Mass B, Limiting Reactants**				
Phenomenon: Daily phenomena are found in the Opening			**DQ: Where are bonds present, and how do they affect the properties of a substance?**		
	Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
Learning Target	**SWBAT: explain the mole concept and its significance in chemistry, including Avogadro's number and molar mass calculations.** **Focus question:** **How big are the atoms?**	**SWBAT converts moles to mass and vice versa** **Focus question:** **How do you calculate the moles of an atom?**	**SWBAT uses the law of conservation of mass to write and balance chemical equations and perform stoichiometric calculations, including the determination of mass relationships between reactants and products** **Focus question:** **What can you learn from balanced chemical equations?**	**SWBAT engages students in the concept of stoichiometry and balanced chemical equations to calculate the amount (in moles or grams) of a particular substance produced or used in a chemical reaction** **Focus question:** **How do you differentiate between the different types of chemical reactions?**	**SWBAT solves stoichiometry problems using technology and conversion factors** **Focus question:** **How do you differentiate between the different types of chemical reactions?**

Opening	**Show students the phenomenon to answer the question, "How are pennines like counting atoms? See think wonder**	**Show students the phenomenon. Use the See Think Wonder protocol to guide students in thinking. How is counting pennies like counting atoms**	**Show students the phenomenon card Use the See Think Wonder protocol to guide student thinking. Mute the audio and stop the video at 2:41. Activity**	**Students will observe the two masses and complete Use the See Think Wonder protocol to guide student thinking**	**The teacher shows the phenomenon for class discussions. Use the See Think Wonder protocol to guide student thinking.**
Guided Practice/Transition Key Vocabulary: The Mole Avogadro's number Molar mass Stoichiometry Atomic mass	**TTW use the GPB chemistry matters on The Mole to introduce and teach Mole and Avogadro's numbers. The teacher pauses the video for the activities and take notes when the bell rings.**	**TTW continue the previous day's activities, The Mole, and explains the mole conversions. Use examples on Page 275, Problem 1, page 279, Problem 2, Page 280, Problem 3, page 282 Problem 4 Use the Mole Conversion Map Use the periodic table of elements to calculate the mass. TTW refer to notes from the previous day to provide additional support to students to aid them in understanding mole conversions.**	**Explain the Stoichiometric Road Map using the problem-solving strategy on PP.321, examples 2,3,4 on PP.322-325 Use stoichiometric lecture notes to explain the conversions**	**The teacher leads the students using the PowerPoint and the video on mass to mass to explain the conversion Grams To Grams STOICHIOMETRY NOTES Students are assigned practice problems on the ppt in group work. Allow students to show their work on the board while the teacher goes around to give support**	**The teacher will assign Activities 7.4 Stoichiometry on pivot community**
Independent Practice (45-50 minutes)	**Students complete the class activities as the video is paused**	**Students will work on the practice problems on pages 276, practice problems 5,6 Page 280, Practice problems 15-16, Page 281 Practice problems 17-18 page 283, practice problems 19-21**	**Student groups of two will engage the Launch Lab to complete the CER with the guiding question, "What evidence can you observe that a reaction is taking place?" TTW provide support to student groups by asking probing questions to guide student thinking**	**Students work on CCC and Get it? on stoichiometry in their ebook PG. 316**	**The teacher assigns practice problems on pages 322, 323, and 325 to students**
Assessment/Summary (5-10 minutes)	**TSW be assigned the exit ticket on the mole. The Mole Exit Ticket**	**TSW practice mole conversion problems 1-4 on pp. 274,**	**TSW practice the following questions from the textbook:**	**TSW will take the lesson check on the ebook Stoichiometry**	**TTW check the student's responses for mastery.**

			PP.323 Q#11-12 PP.324 Q#13-14 PP 325 Q# 15-16 for content mastery.	**calculations.**	
Small Group Tasks (TBA)					

Week 4					
GSE:SC3. c		**Focused Concept:** Calculate the number of atoms and molar mass of the compounds, Find the percent composition of the compounds, Find the empirical and molecular formulas			
Phenomenon: Daily phenomena are found in the Opening			**DQ:** So, how do you estimate the molar mass, percent composition, Empirical, and molecular formula mathematically?		
	Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
Learning Target	**SWBAT find the percent composition of each element in a compound Focus question: Why do we need to learn to calculate the percentage of the elements in a compound?**	**SWBAT find the percent composition of hydrates. Focus question: How do we know the number of water molecules attached to a compound?**	**SWBAT differentiate between empirical formula and molecule; formula *determine the empirical formula of a compound *calculate the molecular formula of a substance Focus question: What information is needed to find empirical formula?**	**SWAT calculate the percentage of sugar in a brand of bubble gum *investigate the murder case using the inquiry project Focus question: Focus question: Why is it important to know the percentages in real life situtions?**	**SWAT solve stoichiometry problems using technology to explore learning Focus question: How are balanced chemical equations used when solving stoichiometric problems?**
Opening (10-15 minutes)	**The teacher shows students the phenomenon picture and uses see, think, and wonder to report their thinking. Teachers should provide students opportunities to share observations and develop questions. The**	**The teacher showed students two different types of salts in the lab. Allow them to make a think wonder chart for them. Teachers should provide students with opportunities to share**	**Students are to detect the differences between the two formulas and respond orally. Teachers should provide students with opportunities to share observations and develop questions. The teacher**	**The teacher shows the students bubble gum brands to hypothesize which has the most significant and lowest sugar. Teachers should provide students with opportunities to share**	**The students launch their gizmos for the simulations. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record**

	teacher should record students' questions.	**observations and develop questions. The teacher should record students' questions.**	**should record students' questions.**	**observations and develop questions. The teacher should record students' questions.**	**questions in whole groups or small groups.**
Guided Practice/Transition (20 minutes) **Key Vocabulary** **Molar mass** **Atoms** **Percent Composition** **Empirical Formula** **Molecular Formula** **Grams** **Mole**	**TTW explain the steps to find the percentage composition using the PowerPoint notes with group practice problems. PERCENT COMPOSITION. TSW work with a partner to find the percent composition of C in $C_6H_{12}O_6$ formula**	**TTW complete the PowerPoint on percentage compositions**	**TTW explain the steps to find the Empirical and Molecular formulas using the Powerpoint notes. Go over the example on pp. 297, Example problem #11 for empirical formula, and pp. 300, Example problem #12 for molecular formula**	**TSW complete the Percent Composition Mini Lab.**	**TSW be guided on how to use the simulations to complete the edited version of the GIZMOS stoichiometry**
Independent Practice (45-50 minutes)	**Students are assigned the percent composition worksheets PERCENT COMP WS Each student will work on the problem written on the poster. Then TSW move to check the problem of the other student and provide feedback/comments to check for correctness or solve if it is incorrect.**	**Students are assigned the percent composition of hydrates on pivot**	**Students will practice problems to find the empirical and molecular formulas**	**TSW work on the case study to apply understanding of percent composition to solve the mystery of The Strange Case of Airlines Flight 1023 Students will develop an argument supported by evidence and reasoning to identify the victim and suspect.**	**Students are assigned the stoichiometry gizmos work and the assessment questions upon completing the Gizmo, TSW write a CER to summarize the findings of the gizmo.**
Assessment/Summary (5-10 minutes)	**The teacher checks the student's work for mastery**	**Students will work on the percent composition of hydrates on the PowerPoint presentation.**	**Students will work on the additional practice problems to find the empirical formula on pp. 299 Q#59-61 to show content mastery**	**A compound sample contains 5.723g Ag, 0.852g S, and 1.695 g O. Determine its empirical formula.** **A compound containing 40.0% carbon, 6.7% hydrogen, and 53.3% oxygen has a molar mass of 180.2 g/mol. What is the molecular formula?**	**Students will complete the assessment questions on stoichiometry gizmos**
Small Group Tasks					

(TBA)					

Week 5					
GSE: SC3. c. d.		**Focused Concept: Volume of gases, Stoichiometric conversions, percent yield, balancing equations,**			
Phenomenon:			**DQ:** • **Stoichiometry Limiting Reactants** • **Percent Yield** • **Theoretical yield**		
	Day 21	**Day 22**	**Day 23**	**Day 24**	**Day 25**
Learning Target	**SWBAT explain how subscripts and coefficients are used to solve limiting reactant problems.** **SWBAT predict the amounts of products and leftovers after reaction using the concept of limiting reactant** **SWBAT predict the initial amounts of reactants given the number of products and leftovers using the concept of limiting reactant** **Focus question:** **How does a limiting reactant affect the product?**	**SWBAT predict the amounts of products and leftovers after reaction using the concept of limiting reactant.** **SWBAT predict the initial amounts of reactants given the number of products and leftovers using the concept of limiting reactant** **SWBAT prove the law of conservation of mass** **Focus question:** **How do you determine the amount of products and reactants involved in a chemical reaction?**	**SWBAT predict the amounts of products and leftovers after reaction using the concept of limiting reactant** **SWBAT predict the initial amounts of reactants given the number of products and leftovers using the concept of limiting reactant** **SWBAT prove the law of conservation of mass** **Focus question:** **How do you know which product to use when finding a limiting reactant?**	**SWBAT complete investigation on limiting reactions.** **Focus question:** **How do you know if you have enough of a reactant?**	**SWBAT calculate the percent yield in a chemical reaction through the theoretical yield** **Focus question:** **Do you always get the calculated amount of product out of a reaction?**
Opening **(10-15 minutes)**	**TTW Show the students the simulations on making sandwiches. Students discuss their observations on See Think Wonder**	**TTW Begin the lesson by showing students a short video clip of a chemical reaction and ask them to brainstorm what they observe on See Think Wonder**	**TTW continue the lab from where they stopped the previous day**	**TTW show the reactions of students to class oral discussions**	**TTW show the responses to students for class discussions of the question: Do you always get the calculated amount of a product out of a reaction ?**

Guided Practice/Transition to Work Session (20 minutes) **Key Vocabulary** **Molar quantity** **Molar gasses** **Percent Yield** **Theoretical Yield** **Stoichiometry**	**The teacher guides the students using the simulations to limit reactants in making sandwiches with the games.** **LIMITING REACTANT SIMULATIONS** **LIMITING REACTANT GUIDED PRACTICE**	**The teacher uses the teacher's notes to explain the limiting reactants with chemical substances. Lab safety protocols for using baking soda and acid will be discussed.** **Lab Materials** **Solid sodium bicarbonate *Baking soda** **Acetic acid solution(Vinegar)** **Beaker** **Graduated cylinder** **Flask** **Scoop or** **Spatula funnel** **Balloon** **Electronic balance**	**TTW conduct a tool talk and expectations of the lab.** **TTW circulate the classroom to support students with any questions or concerns that they have while completing the lab**	**The teacher assigned the Virtual Investigation Lab Limiting Reactants and explained the Expectations**	**The teacher will provide direct instructions to find the theoretical yield, showing the video and pausing to take notes and explain the concept with worked examples**
Independent Practice (45-50 minutes)	**Students complete the worksheets using the simulations LR WORKSHEETS**	**Students complete the lab on the law of conservation of mass** **LAW OF MASS CONSERVATION** **TTW circulates to monitor student performance and will clarify instructions as needed.**	**Students complete the questions on the law of conservation of mass** **LAW OF MASS CONSERVATION QUESTIONS**	**The students are assigned the exploration sheets for the inquiry virtual lab** **INQUIRY VIRTUAL LAB Limiting Reactants**	**Students will practice problems and show work on PERCENT YIELD**
Assessment Summary (5-10 minutes)	**The teacher assigns an exit ticket**	**TSW answer the assessment question on pp. 57**	**Check lab report for mastery**	**Students will be assessed on the report submitted**	**The teacher assigned an exit ticket on page 335.**
Small Group Tasks (TBA)					

Week 6	
GSE: SC2. a,c, g	**Focused Concept:** • **Inter-and intramolecular forces.** • **Phase Changes, Physical and Chemical changes** • **Exothermic and endothermic reactions**

		• Molecular level structure in material science			
Phenomenon: Bonds are formed by attraction between oppositely charged ions or by sharing electrons. Only the valence electrons participate in bonding.			DQ: How do atoms achieve noble gas electron configuration? What type of intermolecular forces are due to the attraction between temporary dipoles and their induced temporary dipoles?		
	Day 26	Day 27	Day 28	Day 29	Day 30
Learning Target	SWBAT explore the various changes in states of matter and explains them Focus question: What role does phase change play in everyday life?	SWAT to distinguish between intermolecular and intramolecular forces and articulate their impact on substance characteristics. Focus question: How do you determine the strongest intramolecular forces?	SWAT constructs explanations about the importance of molecular-level structure in the functioning of designed materials Focus question: How does molecular-level structure affect molecular behavior?	SWBAT defines exothermic and endothermic reactions, identifies reactions as exothermic and endothermic, Calculate the enthalpy change in a reaction Focus question: How are exothermic and endothermic reactions occur?	Students will culminate their learning of all Unit learning targets.
Opening	The teacher shows the ice-melting phenomenon to generate class discussions on which ice melts faster and why. What causes a substance to change phases?	The teacher shows the Phenomenon. Ask the students to observe and complete the answer to why water naturally exists as solid, liquid, and gas on Earth. See, think, and wonder.	The teacher shows the students the phenomenon picture for discussions on see think wonder charts	The teacher shows the phenomenon of candle burning to students and allows them to complete the charts SEE THINK to WONDER	The teacher assigned some review questions as a bell ringer

Guided Practice/Transition to Work Session **Key Vocabulary:** Phase change Melting Freezing Vaporization Condensation Sublimation Boiling point Intermolecular forces Intramolecular forces Hydrogen bond Bond energy Dispersion forces	TTW conduct a hands-on activity where students observe and record different phase changes occurring in everyday items (e.g., ice melting, water boiling). The teacher guides the students in identifying all the changes occurring in the states and taking note of temperature during the change of state. The teacher uses PowerPoint as a guide.	TTW explain the types of intermolecular and intramolecular forces in compounds using PowerPoint examples The teacher then assigns the note-taking template for students to complete. Students complete the notes with teacher notes during presentations.	TTW review the properties of metal. Metal is malleable, ductile, and conductive both thermally and electrically. Nonmetals are non malleable, non ductile, and nonconductive. The teacher assigns students into groups for the Claim and evidence Reasoning projects. The guiding question will be to Write a scientific explanation for whether electricity can be produced through metals or nonmetals.	TTW lead the students to demonstrate the two types of reactions by using the following activities 1. React HCl +Mg . (exothermic reaction) 2. Dissolve ammonium chloride in water (endothermic reaction) The teacher uses the PowerPoint to define and give more examples of exo and endothermic reactions Leads students to define bond energy and determine the bond energy of some responses on the PowerPoint	TTW review the unit questions with the students for 10-15 minutes before the students take the unit test.
Independent Practice	Students are assigned the phase changes on a pivot for classwork	The teacher assigns the worksheets for practice to work with a partner	The teacher allows students to discuss and research in their groups for their CER projects	Students are assigned bond energy worksheets to be completed in groups while the teacher goes around to help Bond Energy Worksheets Students write A CER to prove their findings	Students are assigned unit 2 on illuminate
Assessment/Summary	The teacher checks the student's responses for mastery	Students are given an exit ticket on page 358 or a lesson check assessment on the ebook lesson 2	The teacher will check the students' responses for educated responses and mastery	The teacher checks the student's work for mastery	The teacher checks students' progress on the test as they progress
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep concepts:
Balancing Chemical Equations
Types of Chemical Reactions
Moles

Stoichiometry
Limiting Reactants
Percent Yield
Percent Composition
Intermolecular forces
Phase change

Labs / Investigations		
Mandatory Labs	**Explore Learning Gizmo**	**Pivot Interactives/Phet**
	Gizmo on Stoichiometry Gizmo on Limiting Reactant Gizmo on Moles Gizmo on Polarity and Intermolecular Forces	
Additional Resources/Tasks		
Supplemental Resources	**Common monatomic ions chart**	