PBL UNIT PLANNER						
Name of Project:	Chemistry at War			Duration:		
Subject/Course:	CHEM/HIST/PE	Educator(s):	McGregor/Brand	enburg/Hicks	Grade Level:	10
	Science	 C.8(A) define and use the concept of a mole C.8 (B) calculate the number of atoms or molecules in a sample of o's number C.8(C) calculate percent composition of compounds C.8(D) differentiate between empirical and molecular formulas C.8 (G) perform stoichiometric calculations, including determination me relationships between reactants and products and percent C.8(H) describe the concept of limiting reactants in a balanced 				l using Avogadr s and gas volu al equation
	Social Studies	lies				
	Math					
TEKS & Standards to be addressed:	ELA					

	Augusta das la superior a 0.00 4000 U					
	Avogadro's number – 6.02x1023: th Empirical formula – the simplest ra Molar mass – the mass in grams of Mole concept – the idea that the nu- the SI unit mole Molecular formula – chemical form present in a single molecule Percent composition – ratio of mas the compound Dimensional analysis – the process and cancelling units for all quantitie Limiting reagent or reactant – the ra amount of product(s) produced Stoichiometry – calculations using balanced chemical equation Related Vocabulary: Accuracy Actual yield Mole ratio Percent yield Precision	ne number of repro- tio of the different f a mole of a subsi- umber of particles ula of a molecule t s that each eleme s of solving stoichi eactant that is use the molar relations	esentative particle elements in a give ance and mass of a sub hat includes how n nt in a compound ometric and other d up in a chemica ships between the	s in a mole of a s on compound ostance can be can many atoms of e contributes to the types of problem I reaction that de reactants and pr	substance alculated using ach element are total mass of as by including termines the roducts in a	
	Precision Scientific notation					
	Significant figures					
Unit Vocabulary	Uncertainty					
Rubric(s):	In PBL, rubrics are used to assess	products and pres	sentations with a s	et of clearly artic	ulated, specific cr	
Driving Question(s):	How can the mole concept and stor reactions?	ichiometry help us	determine and pr	edict the product	's of chemical	
Project Idea:	Students will assume the role of ch used by enemies of the state during	emists contracted g WWI.	by Congress to re	esearch chemica	weapons being	
Final Product(s):	Students will "testify" before a spec of chemical weapons being used in	ial congressional Europe during th	committee to brief e Great War.	them on the nat	ure and hazards	
Entry Event (1/31/2023):	Chemical innovaions discussion <u>Chemistry & War Video</u> C.8ABCDGH Quantifying Chemica Know/Need2Know Word Wall	l Change Preasse	ssment			
SCAFFOLDING & FORMATIVE ASSESSMENT CALENDAR						
Project:	Chemistry At War	Start Date:	01/31/2023	End Date:		
C.8AB Mole Concept	Thursday, February 2, 2023		Mond	Monday, February 6, 2023		

Learner Need-to-Know(s): The NTKs are a process used to facilitate inquiry throughout a PBL unit to capture the knowledge and experiences learners bring to a project, as well as record what the learners feel they need to know in order to answer the Driving Question and product a product, etc.	What is a mole? How can we use moles to calculate the number of particles in a substance?				
Scaffolding Experience(s): Scaffolding experiences are designed by the educator to address the need-to- knows identified by the learners throughout the PBL unit. These events can be requested by learners, identified as optional by the facilitator, or delivered whole group. These should be designed using the scaffolding tool resources listed in Chapter 4	Prerequisite: Mole Conversions Made Easy EdPuzzle Lab: Calculating Moles in Daily Life		Concept Builders: <u>Molar Mass</u> <u>Mole Conversions</u> Mole Concept Quiz (Take Home) HW: Empirical & Molecular Formulas EdPuzzle		
Formative Assessment(s)	Exit Ticket Discussion Post		Quiz/checkpoint		
C.8CD Percent Composition & Empirical/Molecular Formulas	Wednesday, February 8, 2023	Friday, February 10, 2023		Tuesday, February 14, 2023	
Learner Need-to-Know(s): The NTKs are a process used to facilitate inquiry throughout a PBL unit to capture the knowledge and experiences learners bring to a project, as well as record what the learners feel they need to know in order to answer the Driving Question and product a product, etc.	How can we calculate empirical and molecular formulas?	What is a mole? How can we use moles to calculate the number of particles in a substance?		What is a mole? How can we use moles to calculate the number of particles in a substance?	
Scaffolding Experience(s): Scaffolding experiences are designed by the educator to address the need-to- knows identified by the learners throughout the PBL unit. These events can be requested by learners, identified as optional by the facilitator, or delivered whole group. These should be designed using the scaffolding tool resources listed in Chapter 4.	Magnesium Oxide Lab	Mystery Gang: Empirical Formulae		Percent Composition/Empirical & Molecular Formulae Quiz Design Checkpoint	
Formative Assessment(s)	Exit Ticket Discussion Post	Mystery Gang Answers		Quiz/checkpoint	

Summative Assessment:	Thursday, February 16, 2023				
C.8G Stoichiometry	Tuesday, February 21, 2023	Thursday, February 23, 2023			
Learner Need-to-Know(s): The NTKs are a process used to facilitate inquiry throughout a PBL unit to capture the knowledge and experiences learners bring to a project, as well as record what the learners feel they need to know in order to answer the Driving Question and product a product, etc.	How can we use stoichiometry to predict the mass of products in a chemical reaction?				
Scaffolding Experience(s): Scaffolding experiences are designed by the educator to address the need-to- knows identified by the learners throughout the PBL unit. These events can be requested by learners, identified as optional by the facilitator, or delivered whole group. These should be designed using the scaffolding tool resources listed in Chapter 4.	Prerequisite: Stoichiometry Made Easy EdPuzzle Lab: S'mores Stoichiometry	Concept Builders: <u>Stoichiometry: Relationships</u> Stoichiometry Quiz (Take Home) HW: Limiting Reactants Made Easy EdPuzzle			
Formative Assessment(s)	Exit Ticket Discussion Post	Quiz/checkpoint			
C.8H Limiting Reactants	Monday, February 27, 2023 Wednesd	ay, March 1, 2023 Friday, March 3, 2023			
Learner Need-to-Know(s): The NTKs are a process used to facilitate inquiry throughout a PBL unit to capture the knowledge and experiences learners bring to a project, as well as record what the learners feel they need to know in order to answer the Driving Question and product a product, etc.	What is a mole? How can we use moles to calculate the number of	particles in a substance?			

Scaffolding Experience(s): Scaffolding experiences are designed by the educator to address the need-to- knows identified by the learners throughout the PBL unit. These events can be requested by learners, identified as optional by the facilitator, or delivered whole group. These should be designed using the scaffolding tool resources listed in Chapter 4.	Lab: Limit the Fizz		Limiting Reactant Practice		Mole Concept Quiz Design Time 1 Empirical Formulas EdPuzzle	
Formative Assessment(s)	Exit Ticket Discussion Post C		Concept Builders:		Quiz/checkpoint	
Final Week	Tue	esday, March 7, 20)23	Thursday, March 9, 2023		
Closing Activities	C.8GH Stoichiometry Summative		Chemistry at War Presentation			
					Kate	