Alleghe Valley S	ny-Clarion Chool District Chemistry	- Organic: Un	nit 2 - Re	sonan	ce Structures	
Unit #:	ACVSD-00067691		Date(s)	10-03-20	018 to 10-26-2018	
Team: Kristir Grade(s): 11 Subject(s): S	Hurrelbrink (Author) , 12 science					
		Unit I	Focus			
This unit is for molecule. The	This unit is for the study of resonance as it relates to organic chemistry. The students must learn how to "move electrons" throughout a molecule. They will learn where they can and cannot place electrons on organic molecules and which resonance structures would be the best.					
		Prior Learning	gs/Connect	ion		
Students must be competent with drawing and reading bond-line structures as well as Lewis Structures of molecules. They must also be able to predict formal charges and the number of valence electrons an atom should have.						
	Stage 1:	Desired Result	s - Key U	nders	tandings	
	Standard(s)			Trar	nsfer	
Pennsylvani Fligible Con	a Assessment Anchors and cent	What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to				
Chemistry: 11	Themistry: 11 Meaning		ning			
 Apply a for nam 	systematic set of rules (IUPAC) ing compounds and writing	ystematic set of rules (IUPAC) Understanding(s) Essential	Essential Question(s)			
chemic binary i polyato Predict configu given a Predict ion bas table (e potenti <i>CHEM.A</i> Explain	cal formulas (e.g., binary covalent, ionic, ionic compounds containing omic ions). <i>CHEM.A.1.1.5</i> the ground state electronic uration and/or orbital diagram for a atom or ion. <i>CHEM.A.2.2.1</i> characteristics of an atom or an sed on its location on the periodic e.g., number of valence electrons, ial types of bonds, reactivity). <i>A.2.2.2</i> in the relationship between the	 What specifically do your understand? What infermake? Students will un U1 Resonance to show 2D molecules Electrons a but all the molded tog real picture within the real picture 	u want student rences should t derstand that structures are representation re not really "n resonance stru ether would gi of what is occ molecule as it r	ts to they meant ns of 3D noving" ctures ve us the curring relates to	 What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering Q1 How does the concept of resonance reflect the electron activity within a molecule? Why are some resonance structures larger contributors than others? How is that possible? What implications do resonance structures have on molecule 	

electron configuration and the atomic
structure of a given atom or ion (e.g.,
energy levels and/or orbitals with
electrons, distribution of electrons in
orbitals, shapes of orbitals).
СНЕМ.А.2.2.3

• Compare and/or predict the properties (e.g., electron affinity, ionization energy, chemical reactivity, electronegativity, atomic radius) of selected elements by using their locations on the periodic table and known trends. *CHEM.A.2.3.2*

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 electron density There are two commandments that should not be violated when drawing resonance structures, do not violate and octet, do not break a single bond The sum of all the formal charges between resonance structures must be maintained from one structure to the next Resonance structures must be draw with double arrows between them while encompassed by large brackets Resonance structures have varying levels of contribution to the overall character of the electrons within a molecule, not all have equal significance 	interactions and chemical reactions?
Acquisition of Kn	owledge and Skill
Knowledge	Skill(s)
<i>What facts and basic concepts should students know and be able to recall? Students will know</i>	What discrete skills and processes should students be able to use? Students will be skilled at
 K1 Throughout the study of this unit the students will learn and be able to use the following vocabulary terms: Resonance octet formal charge violated octet valance electrons pi bond sigma bond electronegativivity curved arrows conjugated double bonds 	 S1 The students will be able to Define resonance. Draw proper arrows for resonance structures. Assign formal charges in resonance structures. Recognize and use patterns in resonance structures to help draw them. Determine if either of the "two commandments" for drawing resonance structures has been violated. Draw/predict the product of a

		 resonance structure, when given the curved arrows. Draw appropriate curved arrows for a resonance structure. Assess the relative importance of resonance structures. Maintain the overall formal charge of a molecule from one resonance structure to the next. Draw/predict all of the relatively significant resonance structures for a molecule. 		
		Stage 2: Assessment Evidence		
		Performance Task(s)		
Alignment	Code Assessment Evidence			
	Alignment Code Assessment Evidence PT1 Untitled Performance Task Diagnostic: • Classroom questioning and discussion • Classroom questioning and discussion • Classroom questioning and discussion • Classroom activities/videos • Notes/practice problems on the board Formative: • Homework (Detailed assignments are listed in the Learning Plan) • In-class assignments (reading packet and practice problems) Summative: • Chapter test - Resonance • Chapter test - Resonance			
		Stage 3: Learning Plan		

Alignment	Code	Learning Activities
	LA1	Untitled
		Learning Activity
		The students have a single, 40 minute period each day. Day 1:
		 The students will receive their resonance packets from the Klein book. I will discuss note taking practices with them for organic chemistry. They will then read together, in groups of 2 or 3, section 2.1 - What is Resonance? (as a close read). When they are finished, we will discuss it.
		Day 2:
		 They will continue with section 2.2 - Curved Arrows - The Tools for Drawing Resonance Structures, as a close read. We will discuss/highlight this section. We will practice together drawing "good" arrows and look at examples of poorly drawn arrows.
		Day 3:
		 We will read together, annotate, highlight, and discuss section 2.3 - The Two Commandments. We will work through the solved practice problems together, then the students will complete the corresponding practice problems to determine if either or both of the two commandments would be broken according to the rules for drawing proper arrows .
		Day 4:
		 We will read together, annotate, highlight, and discuss section 2.4 - Drawing Good Arrows. We will work through the solved practice problems together, then the students will complete the corresponding practice problems to draw in the missing arrows that would show how the resulting resonance structure was produced.
		Day 5:
		 We will read together, annotate, highlight, and discuss section 2.5 - Formal Charges in Resonance Structures. We will work through the solved practice problems together, then the students will complete the corresponding practice problems to draw in the resonance structure that results from the provided curved arrows on the original molecule. The students will also have to add in any formal charges and make sure that any initial formal charge is maintained throughout all of the drawings.

	Day 6:
	 We will read together, annotate, highlight, and discuss section 2.6 - Drawing Resonance Structures - Step by Step.
	 We will work through the solved practice problems together, then the students will complete the corresponding practice problem to draw in the resulting two resonance structures. The students will have to predict the molecule, and add proper curved arrows.
	 The students will also have to add in any formal charges and make sure that any initial formal charge is maintained throughout all of the drawings.
	Days 7-8-9:
	 We will read together, annotate, highlight, and discuss section 2.7 - Drawing Resonance Structures - By Recognizing Patterns.
	 We will work through the solved practice problems together, then the students will complete the corresponding practice problems to draw in the resonance structure that results from the provided curved arrows on the original molecule. Specifically, they will be focusing on mimicking the patterns presented. The students will also have to add in any formal charges and make sure that any initial formal charge is maintained throughout all of the drawings. Additional practice problems will be completed on the board after each trend is presented for the students to get additional practice with it.
	Day 10:
	 The students will complete the worksheet "Practice with Drawing Resonance Structures". Time permitting, we will watch the Professor Dave Explains video for Resonance Structures. (We can push back to day 11 if no time.)
	Day 11-12:
	 We will read together, annotate, highlight, and discuss section 2.8 - Assessing the Relative Importance of Resonance Structures.
	 The students will need a larger amount of time to complete the final practice problems in the packet. It may be helpful to tell them the total number of significant structures that they should have once they are finished.
	• Time will be needed to go over the structures and review maintaining the total formal charge.
	Day 13-14: The students will complete the worksheet "Chp-2 Resonance". They will have to supply the appropriate number of additional resonance structures. The molecules will have to be draw/worked out on separate paper.
	Day 15: Review / correct the complete resonance problems together as a class. Determine the most significant resonance contributors from the resonance structures they have drawn. Day 16-17:

Review the types of problems that will be on the test including: 1. define resonance and list the two commandments. 2. state which commandments are violated (if any) 3. determine if the two molecules presented are resonance structures of one another 4. draw the resulting resonance structure, including formal charges, of molecules when the curved arr provided. 5. complete a specified number of valid resonance structures when given a beginning molecule. Day 18-19: Complete the chapter test for resonance structures with the information listed above. Students will need second day to complete the test because drawing the entire set of resonance structures is very time constructures.	ows are the suming.
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