Curriculum Sample Template
Max. 8 Pages

Grade Level	9th	**Content Area**	Science
Course Title (grades 9-12 Only)	Chemistry		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students should have had plenty of exposure to chemical equations and the concepts of reactants and products. Students should be very comfortable balancing equations and understand the transfer of atoms within a reaction.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	In alignment with FES's one-to-one methodology, students will use their computers, Canvas, and the Acellus software. Canvas and Acellus will provide diagnostic data and videos/modules for chemistry introduction to new material/direct instruction. At the end of the lesson, students will use Acellus Courseware or their Canvas Online Learning System to complete a formative assessment. For the summative assessment, students will also use Acellus or Canvas. Direct instruction will use multiple checks for understanding, and computer-based Kagan cooperative strategies will be implemented during guided practice.		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	5-Physical Science.4 - Chemical Reactions (Investigate relationships between reactants and products in chemical reactions.) #9 - Predict the products of a chemical reaction using types of reactions (e.g., synthesis, decomposition, replacement, combustion). #10 - Explain the energy transfers within chemical reactions using the law of conservation of energy.		
Materials/Resources Needed	Computers, Acellus software, Canvas, headphones, interactive notebooks, scratch paper.		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	Instructional Strategies TW = teacher will. SW = students will. CFU = checks for understanding.	Student Activities
1	**Objective**: • SWBAT identify the type of chemical reaction by indicating during a matching exercise. **Key Points/Terms:** • Single replacement: One element replaces another element in a compound • Double replacement: The cations and anions of two different compounds switch places. • Chemical reactions have the same amount of energy on both the products side and the reactants side, some is exothermic. **Activation of Prior Knowledge**: Teacher will place a "Do Now" activity on Canvas and instruct students to begin. The "Do Now" will be a brief text that introduces the fundamentals of chemical reactions. Students will read the text and complete 3-5 short answer questions about chemical reactions. Online cooperative learning strategies will be used here, including comparing answers and providing one another with feedback. **INM/Modeling**: Teacher will introduce the objective for the day will direct students to open their computers to the Canvas login. Teacher will instruct students to complete the Canvas chemical reactions diagnostic and continue onto the new material modules. The new material modules will introduce chemical reactions and the relationship between their reactants and products. The into to new material will	Students will type the objective and key points in their interactive online notebooks. For the Do Now, students will read about the fundamentals of chemical reactions. Students will respond to all checks for understanding and will volunteer to share their forum answers when prompted. Students will login into Canvas using their computers and headphones. No other screens will be up at this time. Students will complete the chemical reactions diagnostic before moving onto the new material modules. Within the new material modules, students will engage with an introductory overview of chemical reactions and the relationship between their reactants and products. Students will take notes during the module and will continue commenting on the Do Now if they finish their work

	also discuss the different types of chemical reactions. Teacher will use checks for understanding to ensure comprehension and will monitor progress by circulating. Teacher will provide differentiated assistance when necessary and will redirect students if needed. **Guided Practice**: Teacher will direct students to the guided practice module within Canvas. Teacher will provide students with a series of chemical reactions and they must match and identify the appropriate type of reaction Predict the products of a chemical reaction using types of reactions. Teacher will instruct students to answer within their online form, similar to answering with individual whiteboards. Teacher will monitor student response and adjust any instruction as necessary. All responses will be automatically saved in a location accessible to both teachers and students. **Independent Practice**: Teacher will redirect students to their Acellus login and guide them to the formative assessment/independent practice section. Teacher will model the expected behavior and use checks for understanding to ensure comprehension. Independent practice will ask students to type in the type of reaction that appears on the screen. Teacher will monitor with their exemplar answers. **Exit Ticket**: Teacher will pass out index cards that contain chemical reactions that ask for the type of reaction. Teacher will demonstrate where the exit tickets should be placed upon completion and will collect exit tickets from students who do not finish.	before their peers. Students will read through each short text and identify the type of chemical reaction. Students will answer all questions withint he online forum as if they were writing on a whiteboard. Students will share their responses on the module, allowing each other to give feedback. Students will practice identifying 5-7 chemical reactions. Students will login onto Acellus and will complete the formative assessment/independent practice. Students will remain respectful during independent practice and will answer all checks for understanding. Students will type the type of reaction that will form when given certain products. Students will complete the exit ticket about answering what type of reactants will form and will place the tickets in the appropriate location when exiting the classroom.
2	**Objective**: SWBAT predict the products of a chemical	Students will type the objective and key points in their interactive

	reaction by analyzing the type of reaction. **Key Points/Terms:** • Decomposition: one compound splits apart into two (or more pieces). These pieces can be elements or simpler compounds • Synthesis: Essentially the reverse of decomposition reactions. • Replacement: When one element replaces another element in a compound. • Combustion: The reaction of oxygen gas with anything.	online notebooks.
	Activation of Prior Knowledge: Teacher will place a "Do Now" activity Canvas's forum board and instruct students to begin. The "Do Now" will be a review of the previous identifying reactions lesson. Teacher will direct students to annotate the text and find similarities to the prior lesson. The Do Now will be a series of 5-7 questions aligned with the prior mastery check.	Student will actively complete the Do Now. Students will annotoate their text and prepare to be called on to discuss. Students will respond to all checks for understanding and will volunteer to share their forum answers when prompted.
	INM/Modeling: Teacher will introduce the objective for the day will direct students to open their computers to the Acellus login. Teacher will instruct students to open the video tutorial on predicting the products by analyzing the reactants. Teacher will use built in checks for understanding to ensure comprehension and will monitor progress by circulating during the video. Teacher will provide assistance when necessary and will redirect students if needed.	Students will login into the Canvas portal using their computers. No other screens will be up at this time. Students will watch the video tutorial about predicting the products of a chemical reaction by analyzing the products. Students will take notes during the module and will continue annotating the Do Now if they finish their work before their peers.
	Guided Practice: Teacher will ask students to open the forums section of the Canvas online learning system. Teacher will give students 5 minutes to try to predict the products of a chemical reaction by looking and analyzing the type of reaction. Teacher will then direct students to write short notes about the reaction that helps them predict the	Students will open the community forum post in Canvas and have 5 minutes to try to predict the products of a chemical reaction. Students will predict these products by analyzing the type of

	products. Teacher will walk around the room and provide assistance when necessary, addressing any consistent areas of misunderstanding.	reaction. Students will participate in the forum and respect one another.
	Independent Practice: Teacher will direct students to the formative assessment/independent practice section within Canvas. Teacher will model the expected behavior and instruct student to predict the products of a 10 chemical reactions by analyzing each type of reaction. Teacher will circulate the room with exemplar to address specific interventions.	Students will login onto Canvas and complete the 10 chemical reactions problems. Students will predict the products of the chemical reaction by analyzing the reaction. Students will remain respectful during independent practice and will answer all checks for understanding.
	Exit Ticket: Teacher will ask students to respond to one final exit ticket question. Teacher will place a problem on the board and students will predict the products of one chemical reaction and write their answers on an index card when leaving class. Teacher will direct students to reference the key points when answering the questions and where to place the cards when finished.	Students will complete the exit ticket text and predict the products of one chemical reaction. Students will write their answers on an index card when leaving class

3	**Objective**: SW explain the energy transfers within chemical reactions by referencing the law of conservation of energy. **Key Points/Terms:** • When energy is transferred to an object, the temperature of that object increases. • When energy is transferred within a chemical reaction, the total energy remains the same. **Activation of Prior Knowledge**: Teacher will post a "Do Now" activity on Canvas and instruct students to begin. The "Do Now" will ask students to describe how energy is being used when iron combines with oxygen to form rust. Teacher will recognize remarks that reference the key points. **INM/Modeling**: Teacher will introduce the objective for the day will direct students to open their computers to the Canvas login. Teacher will instruct students to complete the Canvas energy transfer diagnostic and continue onto the new material modules. In the new material modules, students will complete a read to learn about how energy transfers within a chemical reaction. Teacher will use checks for understanding to ensure comprehension and will monitor progress by walking around the room. Teacher will provide assistance when necessary and will redirect students if needed. **Guided Practice**: Teacher will ask students to open the forums section of Canvas. The forum will show different graphics that represent energy transfer from one object to another within a chemical reaction. Teacher will direct students to write complete sentences that explain how energy is transferred within the chemical reaction and how it demonstrates and explains the law of conservation of energy. Teacher will also ask students to continuously cite	Students will type the objective and key points in their interactive online notebooks. Student will actively complete the Do Now. Students will raise their hands to provide answers about how energy is transferred when iron combines with oxygen to form rust. Students will volunteer to share their forum answers when prompted. Students will login into the Canvas portal using their computers. No other screens will be up at this time. Students will complete the energy transfer diagnostic before moving onto the new material modules. Students will complete the read to learn that discuss energy transfer and the law of conservation of energy within chemical reactions. Students will take notes during the module and will continue commenting on the Do Now if they finish their work before their peers. Students will open the forum post in the online learning system and access the energy transfer graphics. Students will answer check for understanding questions by referencing the law of conservation of energy within the illustrations of chemical reactions. Students will write complete sentences to explain how energy is transferred within the chemical reaction and how it demonstrates and explains the law of conservation of energy.

	the law of conservation of energy when answering checks for understanding about the energy transfer graphics. **Independent Practice**: Teacher will redirect students to their Acellus login and guide them to the energy transfer within chemical reactions formative assessment/independent practice section. The independent practice will ask students to type complete sentence responses that explain how energy transfers within chemical reactions. **Exit Ticket**: Teacher will direct students to take out a sticky note for the exit ticket. Students will write a one sentence summary of how energy is transferred within chemical reactions. Teacher will direct students to place the sticky note on the door when leaving.	Students will login onto Canvas and will complete the formative assessment/independent practice. Students will type complete sentence responses that explain how energy is transferred within chemical reactions When finished, students will reflect on their performance on the formative assessment. Students will complete the one sentence exit ticket problem and place sticky note on door when leaving. Students are expected to write a one sentence explanation for energy transfers and should use the key points as a guide.

Summative Assessment Items:

(Two points each. 10 points total. Must achieve 80% of better to master the standard)

1. Predict the single replacement product for the reaction $Zn + CuCl_2$
2. Balance the equation and determine the type of reaction for ___NH_3 → ____N_2 + ____H_2
3. Balance the equation and determine the type of reaction for ___Al + ___ H_2SO_4 → ___H_2 + $Al_2(SO_4)_3$
4. Define what it means to transfer energy and to have an object do "work."
5. Describe the energy transfer when a golfer hits a golf ball.

Answer Key:

1. $ZnCl_2 + Cu$
2. $2NH_3$ → ____$N_2 + 3H_2$ (Decomposition Reaction)
3. $2Al + 3H_2SO_4 \rightarrow 3H_2 + Al_2(SO_4)_3$ (Single Replacement)

4. If you put energy into an object, then you do work on that object (mass). If a first object is the agent that gives energy to a second object, then the first object does work on the second object. The energy goes from the first object into the second object. At first we will say that if an object is standing still, and you get it moving, then you have put energy into that object. The object has kinetic energy as a result of your work.

5. The club does work on the golf ball as it strikes the ball. Energy leaves the club and enters the ball. This is a transfer of energy. Thus, we say that the club did work on the ball.