

Chemical Reactions Lesson Plan

Grade or Subject: 10 th /Chemistry/Physical Science	Topic: Types of Chemical Reactions	Teacher
Essential Question: (What question do you want students to be able to answer by the end of this lesson?) Students will be able to identify the 5 types of chemical reactions and the different product combinations they yield. Students will be able to identify whether a chemical reaction took place or not based on reactants and products present.		
Learning Objective: (What specifically do you expect students to know or be able to do as a result of the lesson?) At the end of this lesson, students will classify chemical reactions in everyday scenarios and will create models through the use of visual representations, diagrams and interactive tools. Mastery of the content will be shown through modeling and interactive activities and collaboration. Students will know whether a chemical reaction has taken place or not, and reinforce their understanding of the basic reactions that occur in everyday life.		
NGSS Standard(s) or Performance Expectation(s) - Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. - Develop and use a model to describe how reactants interact to yield products and determine which specific type of reaction has occurred. California ELD Standard(s): -CCSS.ELA-Literacy.L.10.3: Use knowledge of language and its conventions when writing, speaking, reading, or listening. Emerging: 2. Interacting via written English: Engage in short written exchanges with peers and collaborate on simple written texts on familiar topics, using technology when appropriate. -CCSS.ELA-Literacy.SL.10.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on other's ideas and expressing their own clearly. Emerging: 1. Exchanging information/ideas: Engage in conversational exchanges and express ideas on familiar topics by asking and answering yes-no and wh-questions and responding using simple phrases.		
Science & Engineering Practices (SEPs): Developing and Using Models Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena Analyzing and Interpreting Data Constructing Explanations and Designing Solutions	Disciplinary Core Ideas (DCIs): PS1.B Chemical Reactions PS1.A Structure and Properties of Matter MS. LS1.C Organization for Matter and Energy MS.LS2.B Growth and Development of Organisms	Crosscutting Concepts (CCCs): Energy and Matter Patterns Scientific Knowledge Assumes an Order and Consistency in Natural Systems
Evidence: What data will you collect to assess the extent to which the desired outcome(s) were achieved? What data will you collect to assess the extent to which the desired outcome(s) were achieved? Data will be collected and observed in the form of interactive participation (chat/peardeck) where students will share their written predictions, and overall assessment of what occurred after the presentation. Lastly, students will be split up into 5 groups (breakout rooms) and will display their mastery of the material by modeling their understanding. Each group of students will present a simple model of each reaction and create a visual model using technology (Gizmo).		
Prior Student Knowledge and Context: (Where does this fit into a unit of instruction, connections with previous and future lessons? What are the explicit connections with student prior knowledge and/or experiences in daily life?) This fits in the visual representation of different chemical reactions students will observe throughout the course. Students will develop an understanding of the key properties to identify in the products and reactants. Learning about the five types of chemical reactions will help students understand what to expect throughout the course. It will also tie into the fundamental principle that matter cannot be created or destroyed. This may fit into everyday life where a student may observe chemical reactions when cooking and cleaning and will then have a reasonable explanation for what is occurring.		
Materials and Technology: (Anything needed to conduct the lesson, including handouts, lab equipment, technology, etc.) Desktop Computer Microsoft Powerpoint Matches Paper Organic Chemistry Set Gum Drops Toothpicks 5 Mini Staplers Alphabet Stickers Ipad/Chromebooks (optional)		
Safety and Clean-up: Non-hazardous and safe for staff to clean up without harm or special		
Differentiation/Universal Access (UA)/Culturally Responsive Pedagogy (CRP): (Choose one of these to respond to) ASL interpreter can be provided if needed for the hearing/speech impaired. Lesson can be printed out in script form if necessary to accommodate individual student needs.		

Step-by-Step Procedures and Instructional Strategies within the 5E Model: (Describe step-by-step what will be taking place during the lesson. What will the teacher be doing to facilitate, engage, and evaluate student learning and what will students be doing as active learners? Describe in tandem.)	
ENGAGE - Teacher Does:	ENGAGE - Student Does:
Teacher will ask for participation/assistance and call on select students to recall information from previous lessons and assist with demonstration. Engaging students with questions that are worded precisely to incite deep thought and critical thinking in regards to the subject content matter (How, why, where, when, what if).	Students will actively participate and answer questions while collaborating in groups. Students will interactively engage in the demonstration and assist by following directions. Prompted with questions from the instructor, the students will be receptive and ready to collaborate and participate in classroom discussion.
EXPLORE - Teacher Does:	EXPLORE - Student Does:
Teacher will explore the idea of the unknown and engage students in the uncertainty of science. The outcome will not be revealed immediately, as students will use prior knowledge to predict the end result. The teacher will also ask questions to incite thought in regards to the material, and prompt and redirect students accordingly.	- Actively participate by making rational predictions of what will occur during the presentation and explain why it did or did not happen in the manner expected. Students will also be able to identify key products and reactants that indicate a specific reaction took place - Students will ask questions that will prompt them to the correct answer as opposed outright asking for the answer. Wait time will be implemented to have students collaborate and interact in a constructive manner. Students will research basic chemical reactions with the use of technology to model /act the specific reaction they choose.
EXPLAIN - Teacher Does:	EXPLAIN - Student Does:
Demonstrates and explains the formation the 5 different types of chemical reactions. The explanations will be provided through text (powerpoint) and recited through a lecture. Students will be given assistive technology is available to help facilitate the lesson and its content.	The inquisitive student will be engaged and interested in partaking in an activity where the outcome is not yet defined. Students will collaborate constructively and complete diagrams, models and materials provided to assess their level of competency on the lesson.
ELABORATE - Teacher Does:	ELABORATE - Student Does:
Teacher will explore and briefly talk about the importance of chemical reactions in our everyday lives (using visual model). Teacher will also explain the five different type of reactions and when and where they are observed in everyday life.	Student will engage by asking questions pertaining to its application to everyday life. Students will describe natural phenomena and categorize it under one of the five types of chemical reactions (google slides). Students will be given time to elaborate on their answers, work on their models and share with each other.
EVALUATE - Teacher Does:	EVALUATE - Student Does:
Collect the sheet of paper in which the students have made predictions and answered the questions shared within their groups. Teacher will evaluate student understanding based on their models and group interaction in their brief presentations.	Student will actively participate and answer questions while collaborating in groups. Assessment made will provide an approximation of their level of understanding. Models presented and group role play will reflect their level of competency.
<u>Rationale:</u> This lesson gives students an opportunity to examine the complex concept behind chemical reactions and the processes that undergo when initiated. This presentation focuses primarily on 5 basic types of chemical reactions, but it is through this presentation that students are able to distinguish between the different types based on their products and reactants. This can facilitate the concept for students who are visual learners and learn best through modeling or hands-on activities that allow for models (Parkay, W. & Stanford, B. H.). Grouping students based on their strengths and weaknesses for this activity may prove to be beneficial in creating an optimal classroom environment that maximizes student learning potential (Weiner 73). Students will be able to categorize natural phenomena based on the key characteristics behind each type of reaction. Categorizing subject matter after a lesson proves to be beneficial for the retention of the content reviewed (Parkay, W. & Stanford, B. H.). The modeling represented through the materials provided to the students proves to help students grasp the spatial arrangement of molecules and the interaction that occurs during chemical reactions. Demonstrating and providing instructions to the class while building the model helped keep the students engaged and focused on the lesson while demonstrating their knowledge on chemical reactions (Henriques "What makes for an effective demonstration"). Before students determine whether a chemical reaction has taken place or not, they will be able to use clues and look for signs that indicate that it has. Furthermore, the presentation visually depicts and reinforces the idea of conservation of mass in chemical reactions.	

