

Introduction to Chemical Reactions

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

Introduction to Chemical Reactions

Grades 7-10	Introduction to Chemical Reactions
Essential Questions:	
Lesson Objective:	
Students will:	
- Learn how to write word and chemical equations - Learn vocabulary associated with chemical reactions such as reactants, products, catalyst, energy, etc. - Learn the symbols associated with chemical reactions - Demonstrate an understanding of how chemical reactions are used in the real world - Investigate, through inquiry, the characteristics of chemical reactions - Demonstrate an understanding of the general principles of chemical reactions	
Possible Student Misconceptions:	
- All chemical reactions involve blowing something up - Chemical reactions always produce heat	
Materials:	
1 device (smartphone, chromebook, laptop, tablet, or computer) per student - A means of projecting a PowerPoint presentation - Internet access	
Teacher Notes:	
- All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click on the image and click Edit Hyperlink or something similar. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I don't believe in long lessons. If you feel your students are losing focus, stop the PowerPoint and give them a 5-minute break. If you'd like to see more of my video collection here - http://www.teachwithfergy.com are tons of brain-break videos to choose from all grouped by category.	

Introduction to Chemical Reactions - 5E

Engagement Phase	
Chemistry video	
- Watch the video – <i>Chemists Know</i> which can be accessed here - http://www.teachwithfergy.com/chemists-know/ - Just let them watch and enjoy the video - Once it's done, ask your students to write down one thing they know about chemical reactions. This can be anything and is meant to simply get them thinking about the topic.	
Teacher Note:	
- The video is about four minutes long - If for some reason the video doesn't play, go to www.youtube.com and type in "Chemists Know - (Parody of "Let It Go" from Frozen) - University of California Irvine" to locate it.	
Exploration Phase	
Exploration - The Chemistry of Explosions – Reading	
- Individually, students will read the article - <i>Exploration – The Chemistry of Explosives</i>. - Students will submit their reading comprehension answers to you	
Teacher Notes:	
- This is an excellent opportunity for your students to explore the fun side of chemical reactions as well as improve your students' scientific literacy - Feel free to reduce the number of questions as this file is fully editable - For some students, this task may take longer if their reading and/or comprehension skills are lower	
Explanation Phase	
Chemical Reactions Lesson	
- Go through – <i>Explanation – Chemical Reactions Lesson</i>. There are many opportunities to engage your students as well as check their understanding through practice problems. <i>Chemical Reactions</i>. This lesson covers the following topics: - Learn how to write word and chemical equations - Learn vocabulary associated with chemical reactions such as reactants, products, catalyst, energy, etc. - Learn the symbols associated with chemical reactions - Demonstrate an understanding of how chemical reactions are used outside the classroom - Demonstrate an understanding of the general principles of chemical reactions	

Teacher Notes:	Goals
- Knowledge of what a chemical symbol and formula are will greatly reduce the learning curve - No prior knowledge of chemical reactions is necessary - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select Edit Hyperlink or something similar. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ - I have also enclosed a .PDF version of both the teacher and student versions	- Students develop understanding of the content - Observations and experiences are discussed and critiqued - Students develop vocabulary - Students are able to connect the content presented to previous experiences
Elaborate Phase	Duration: 1 hour
Elaborate – Scavenger Hunt Activities	Teacher Role – Facilitate learning and keep students focused
Your students will complete – <i>Elaborate - Scavenger Hunt Activity</i>. This activity will require your students to move beyond what was covered directly in the lesson and allow them to demonstrate how knowledge of chemical reactions can be applied to the real world. Teacher Notes: - Students will work in groups of two or three - Each group will only require a single device (smartphone, tablet, chromebook, laptop, etc.).	Goal
	Students use their newly obtained knowledge to propose solutions and extend their learning to new situations
Evaluate Phase	Duration: 20-50 min.
Evaluate – Chemical Reactions Worksheet	Teacher Role – Distribute and collect evaluation
- Have your students complete – <i>Evaluate – Chemical Reactions Worksheet</i> - This task can be started in class then finished for homework or completely done in one setting Teacher Notes: - The answer key is located in the same folder - If you choose to mark it, it's sometimes best to have the students peer evaluate - Placing students in small groups and having them check each others work will accomplish two things - Provide immediate feedback on the activity they just completed - Significantly reduce your marking time **Peer evaluation is not needed, only suggested when appropriate	Goal
	Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

Complete Lesson

Chemical Reactions



A Spectacular Chemical Reaction



All chemical reactions...

- have two parts:
 1. Reactants = _____
 2. Products = _____
- The reactants will turn into the products.

Word equation:

Reactants → Products



➤ Energy is used to react solid iron with oxygen gas to form solid Iron (III) Oxide

➤ Energy + Iron + Oxygen gas → Iron (III) Oxide

states are not included in word equations



Interactive and Engaging Activities

Device-Based Scavenger Hunt Chemical Reactions



Includes

- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks and laptops

- 100% Digital
- Simulations
- Quizzes
- Videos
- Games
- Word Scramble
- and more



The Chemistry of Explosions - Scientific Reading Comprehension Article



Improve your students **Scientific Literacy** and **Analysis Skills**, use as an **Emergency Substitute Plan** or create **Applicability** in your classroom

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

