

Types of Chemical Reactions and Balancing- 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

Types of Chemical Reactions and Balancing - 5E Lesson

Grades 9-11	Types of Chemical Reactions and Balancing	Ongoing Lesson
Lesson Objective: Students will: - Investigate the five main types of chemical reactions – synthesis, decomposition, double displacement and combustion - Understanding the difference between the types of chemical reactions - Use appropriate terminology related to chemical reactions - Demonstrate their understanding of the types of chemical reactions using word equations and balanced chemical equations for simple chemical reactions - Analyse chemical reactions used in a variety of applications, and assess their impact on society and the environment		
Possible Student Misconceptions: - All reactions involve a release of energy (i.e. an explosion) - Once a chemical reaction is complete, the original substance remains in one form		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students - 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 it doesn't, 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 their 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/science are tons of brain-break videos to choose from all grouped by category.		

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Engagement Phase - Provide your students with the questions found in the file <i>Engagement – Chemical Reactions</i> - Students are to answer the questions as they watch the video - The video can be accessed here - http://www.teachwithfergy.com/bill-nye-the-science-guy-chemical-reactions-clip/ - Once it's done, ask your students to complete the final question and review their answers with the person beside them - Use their answers to create a class discussion Teacher Notes: - The video is about two minutes long - If for some reason the video doesn't play, go to www.youtube.com and type in "Bill Nye The Science Guy on Chemical Reactions (Full Clip)" to locate it. It will be the one created by the official Bill Nye account	Duration: 15 minutes Teacher Role: Learning and understanding
Exploration Phase Exploration – Lab Station Activities - There are two lab station activities included in this 5E bundle – 1) Chemical Reactions and Balancing 2) Balancing Chemical Equations - I always do Chemical Reactions and Balancing but if you have time and the inclination, you can do both - In groups of 2-3, have your students complete one or both of the lab station activities in the folder <i>Exploration – Lab Station Activities</i>. Once they're done a lab station, they will submit their passport to you. Teacher Notes: - The complete instructions for the Lab Station activities can be found in the <i>START HERE – Instructions</i> files.	Duration: 1 hour Teacher Role: Learning and understanding
Explanation Phase Explanation – Chemical Reactions and Balancing Lessons - There are two lessons included - To complete both, you'll need three days - The lessons can be found in the folder – <i>Explanation - Lesson</i> - There are many embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lessons 1. Types of Chemical Reactions. The lesson covers the following topics: ✓ Synthesis Reactions	Duration: 2 hours Teacher Role: Concepts by material four presentation

✓ Decomposition Reactions ✓ Single Displacement/Replacement Reactions ✓ Double Displacement/Replacement Reactions ✓ Combustion Reactions 2. Balancing Chemical Equations. The lesson covers the following topics: ✓ How to balance chemical equations ✓ Practice 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 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	Goals ☐ 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 Elaborate – Scavenger Hunt Activity 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 apply their knowledge.	Duration: 1 hour Teacher Role – Facilitate learning and keep students focused
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 Worksheets Have your students complete the worksheets – 1) <i>Evaluate - Types of Chemical Reactions Worksheet</i> and 2) <i>Evaluate - Balancing Worksheet</i>	Duration: 30 – 90 min. Teacher Role – Distribute and collect evaluation
Teacher Notes: - These worksheets can be completed for homework or as an in-class activity - It's sometimes best to have the students peer evaluate - Placing students in small groups and having them exchange papers to mark will accomplish two things 1) Provide immediate feedback on the worksheets they just completed 2) 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

Two Complete Lessons

Practice Examples

- $\text{H}_2 + \text{O}_2 \rightarrow$
- $\text{H}_2\text{O} \rightarrow$
- $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow$
- $\text{HgO} \rightarrow$
- $\text{KBr} + \text{Cl}_2 \rightarrow$
- $\text{AgNO}_3 + \text{NaCl} \rightarrow$
- $\text{Mg}(\text{OH})_2 + \text{H}_2\text{SO}_3 \rightarrow$

← Make sure your students are on track

Student copies with blanks

Videos embedded right into your slideshow

Types of Chemical Reactions

The five types of chemical reactions that will be covered include:

1. Synthesis
2. Decomposition
3. _____
4. _____
5. _____



5 Types of Reactions Video

Chemistry

Balancing Chemical Reactions

2 Cracker Squares + 1 Marshmallow + 3 Chocolate Squares → 1 S'more

2 Cq + 1 Mm + 3 Ch → 1 Cq₂MmCh₃

Chemistry

Types of Chemical Reactions

Diagram showing the reaction of two hydrogen molecules (H₂) and one oxygen molecule (O₂) to form two water molecules (H₂O).

Image of a scientist in a lab coat performing a chemical reaction.

Interactive and Engaging Lab Station and Scavenger Hunt Activities

Chemical Reactions and Balancing Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Device-Based Scavenger Hunt Types of 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



Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

