

GirlsGotSTEAM: Elephant Toothpaste

Program:	Elephant Toothpaste Explosion!
Age Range:	4th-7th grade
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Description:	Today we will learn about catalysts, chemical reactions, and chemical changes!

NOTE TO INSTRUCTOR: This lesson plan is an OUTLINE - use it as you will to execute your workshop. Feel free to add and remove material as needed. Attached is a PowerPoint for your student to complete.

The PowerPoint will include pictures, additional information, and instructions. It **SHOULD NOT** be the primary resource to run the workshop. Please refer to the lesson plans for detailed instruction. If you have any questions, comments, or concerns about any information in this workshop, please email girlsgotsteamorl@gmail.com

Time	Objective	Component
Block 1: Introduction	Students should be introduced to the concepts of chemical/physical changes.	Activity: Introduction (PowerPoint)
Block 2: Make	Students should use the materials given to them to assemble their own mini elephant toothpaste demonstration.	Activity: Make the model
Block 3: Reflect	Students should end by reflecting on the concept of catalysts in chemical reactions.	Activity: Discussion

Materials for Elephant Toothpaste

NOTE TO INSTRUCTOR: The materials listed below are required to complete this activity. The powerpoint attached with this lesson plan has the materials to display as well. These materials are made for a group of students. We recommend you make groups of 3-4 students.

Empty Soda bottles (16 oz.) x • ½ cup of hydrogen peroxide (6%) • dish detergent • food coloring (any color works) • 1 tsp yeast dissolved in 2 tbsp warm water • funnel • empty container to hold the experiment (ex. Foil cake pan) • goggles • smock



Block 1: Introduction

• Activity: Introduction

- To begin, it is important that you and your students are able to understand what this workshop will be about! In the PowerPoint, we have referenced some materials and videos. Please look over them before the workshop (this way you can teach your students better)! Feel free to include more materials and/or videos.
- Ask students, if anyone knows what the difference between chemical and physical changes are. It is important that they are able to distinguish between the two. ***KEY IDEA: MAKE CONVERSATION AND DISCUSS**
- Lead into how chemical changes work. First, begin by explaining that chemical changes occur when an original substance is changed into a new one. (ex. release/absorption of energy)
- Next: Talk about catalysts and the role they will serve in this experiment. A catalyst can be anything that speeds up the rate of a reaction. In this demonstration, yeast is the catalyst which makes hydrogen peroxide release its oxygen atom, thus causing gas to be released and the temperature to change.
- Now, describe that an exothermic reaction has taken place, and the decomposition of hydrogen peroxide has occurred.
 - If this concept is hard for your students, use pictures or the materials to explain the topics.

At the end of this block, the students should have an understanding of what chemical changes and catalysts are .

Block 2: Assemble

• Activity: Assemble the Demonstration

Please make sure your students stay safe during this activity. They shouldn't be touching any of the substances without the proper protection.

1. Make sure every group has the materials which were listed above.
 2. Place the empty bottle inside the container, and put the funnel inside the opening of the bottle.
 3. Add 3-4 drops of food coloring to the ½ cup of peroxide, then pour the mixture through the funnel into the bottle.
 4. Add about a squirt or two of the dish detergent
 5. ***Before adding yeast in the next step, ask students about their predictions, knowing that yeast is a catalyst in this reaction. What do they think will happen? Discuss with group members.***
 6. Pour the yeast and water mixture quickly into the bottle and take out the funnel.
 7. Watch your awesome reaction take place!
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Block 3: Reflect

- This should be the last block in the day. At this point, instructors should start a discussion to hear the student's thoughts and opinions. Furthermore, instructors should once again emphasize the students' findings on chemical reactions

- **Activity: Discussion**

- The class should discuss what they thought about the experiment and what they learned. What was hard about this? What was easy? We have included questions in the PowerPoint. Be sure to include as much as needed in order to have an engaging conversation.
 - Have students write down observations or talk among their group
 - **NOTE TO INSTRUCTOR:** Discussion should be fun, interactive, and detailed. Please ensure that students understand the objective of this workshop.
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We hope your students will enjoy exploring chemical changes through making your own mini reaction! Thank you so much for using GirlsGotSTEAM's resources for your workshop - our team would be beyond happy to provide you with more free and enjoyable lesson plans in the future! For any questions, comments or concerns, please email girlsgotsteamorl@gmail.com or DM us @girlsgotsteam on Instagram!

