Core Skills Analysis

Science

- Students learned about chemical reactions by observing the rapid decomposition of hydrogen peroxide catalyzed by yeast or potassium iodide, producing a large amount of foam known as 'elephant toothpaste.'
- The activity demonstrated the practical application of catalysts in speeding up reactions without being consumed, highlighting catalytic activity.
- Students observed exothermic reaction characteristics as the foam generated heat during the experiment.
- The experiment introduced concepts of gas production and physical changes related to the formation and expansion of foam.

Tips

To deepen understanding of this catalytic reaction, encourage students to experiment with different catalyst types or concentrations to observe how reaction rates change. Follow up with discussions on real-world uses of catalysts in industry and biology, such as enzymes or catalytic converters. Complement this with simple demonstrations of physical versus chemical changes using other household materials. For older students, introduce the concept of reaction kinetics and the role of surface area or temperature. Incorporating a safety discussion about handling chemicals responsibly can also enhance scientific literacy and lab safety skills.

Book Recommendations

- Elephant Toothpaste and Other Awesome Science Experiments by Susan H. Gray: A lively guide with step-by-step instructions on fun chemical reactions suitable for kids, including the elephant toothpaste experiment.
- Catalysis: The Science and Engineering of Catalytic Reactions by James Spivey: An introductory book explaining how catalysts work, ideal for older students curious about the science behind reactions like elephant toothpaste.
- Chemical Reactions at Home by Kathy Wollard: A practical guide with safe, accessible chemistry experiments that demonstrate everyday chemical reactions.

Learning Standards

- NGSS 5-PS1-4: Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- NGSS MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- NGSS MS-PS1-6: Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Try This Next

- Worksheet asking students to label parts of the reaction (reactants, products, catalyst) and describe observations.
- A creative drawing prompt for students to illustrate the reaction process step-by-step with captions.