Lesson: Decomposition Reaction	Name:
Teacher:	Date:

Decomposing Hydrogen Peroxide with Yeast Free Lesson Plan – STEM Scholars Hub

Lesson Focus

Understanding chemical reactions and energy transformation through an exothermic reaction using yeast and hydrogen peroxide.

Materials

- 3% hydrogen peroxide
- Active dry yeast
- Warm water (~100°F)
- Liquid dish soap
- Measuring spoons
- Small bowl
- Graduated cylinder or measuring cup
- Clear plastic or glass bottle
- Food coloring (optional)
- Tray or shallow container
- Safety goggles

Lesson Objectives

Students will:

1. Identify and describe the components of a chemical reaction.
2. Demonstrate how yeast acts as a **catalyst** in the decomposition of hydrogen peroxide.
3. Analyze energy changes during the reaction and classify it as **exothermic**.

Procedures

1. Introduction (5 min)

- Discuss chemical reactions in daily life, focusing on energy transformations.
- Ask students if they've observed reactions like baking, rusting, or decomposition.

- Introduce the concept of **catalysts** and how they speed up reactions without being consumed.

2. Experiment (15 min)

- Dissolve yeast in warm water in a small bowl.
- Add dish soap to hydrogen peroxide in a clear bottle.
- Pour the yeast mixture into the bottle and observe the reaction.

3. Observation (10 min)

- Students record observations about foam production, heat, and other reaction characteristics.
- Discuss why foam forms and the role of **oxygen gas** in the reaction.

4. Generalization (10 min)

- Review the chemical reaction:

$$2H_2O_2 \xrightarrow{\text{catalase}} 2H_2O + O_2$$

- Emphasize that this is an **exothermic reaction**, releasing energy as heat.

5. Assessment (5 min)

- Formative assessment: Ask students to describe the role of yeast and identify the type of reaction.
- Collect observation sheets for review.

Safety Precautions

- Students must wear safety goggles throughout the experiment.
- Handle hydrogen peroxide carefully; avoid contact with skin and eyes.
- Notify the teacher immediately if spills occur.
- Wash hands thoroughly after the experiment.

Accommodations for ELL, ESE, etc.

- Provide visual aids such as diagrams of the setup.
- Use simplified language for key concepts.
- Allow students to work in pairs or small groups with peer support.

- Offer verbal instructions alongside written ones and sentence frames for observations and conclusions.
- Allow extended time for completing tasks and assessments if needed.