



Pre-Lab, Skills, and Standards Alignments

BUBBLING LIVER | BUBBLING POTATOES

In this lab, students will observe the chemical reaction between catalase enzyme and hydrogen peroxide. When small pieces of liver or potato are placed in hydrogen peroxide, chemical activity is visible as the enzyme digests hydrogen peroxide into water and oxygen. The lab will also explore factors that affect enzyme function, and the structure and function relationship between enzyme and substrate.

Lab Length: 1 hour

Suggested Pre-Lab Teaching

- Central Dogma (genes to proteins)
- Enzyme Function

Lab Skills

- Follow a multi-step procedure to perform a controlled experiment.
- Observe enzymes acting as catalysts of chemical reactions.
- Collect data to compare control and experimental results.

Conceptual Knowledge/Skills

- Describe the structure and function relationship between enzymes and their substrates.
- Use lab result data to support or refute a claim about enzymes used in industry.

New York State Science Learning Standards/NGSS

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Analyzing and Interpreting Data</u> Analyze and interpret data to determine similarities and differences in findings.</p> <p><u>Constructing Explanations and Designing Solutions</u> Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.</p>	<p><u>PS1.B: Chemical Reactions</u> Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different particles and these new substances have different properties from those of the reactants. (MS-PS1-2) (NYSED) Some chemical reactions release energy, others absorb energy. (MS-PS1-6)</p>	<p><u>Patterns</u> Macroscopic patterns are related to the nature of microscopic and atomic level structure.</p> <p><u>Cause and Effect</u> Cause and effect relationships may be used to predict phenomena in natural or designed systems.</p> <p><u>Structure and Function</u> Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts; therefore, complex natural and designed structures/systems can be analyzed to determine how they function.</p>