

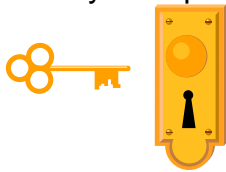


## Enzyme Activity Lab

Name \_\_\_\_\_ Date \_\_\_\_\_ Score \_\_\_\_\_

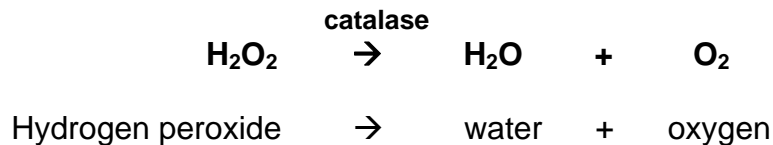
### Background Information:

Enzymes are protein catalysts that speed up chemical reactions of the substrates on which they work. They are specific for their reactions, and are said to fit together like



“lock and key”.

This lab is examining the effect of temperature on enzyme activity. The liver contains the enzyme *catalase*, which is responsible for breaking down the substrate *hydrogen peroxide* ( $H_2O_2$ ) in the liver to  $H_2O$  and  $O_2$  gas.



This reaction normally occurs in the body, but with the help of the *catalase* enzyme, the reaction rate increases. The rate of the reaction can be determined by the amount of  $O_2$  gas produced.

### Hypothesis:

Design a hypothesis according to your prediction of what will occur to the enzyme activity when the enzyme's temperature is changed from room temperature below.

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### Variables:

Determine the independent and dependent variable. The independent variable is the variable that is manipulated by the experimenter. The dependent variable is the responding variable to that change.

Independent variable: \_\_\_\_\_

Dependent variable: \_\_\_\_\_

**Materials:**

Chicken Liver	Hot plate
Hydrogen Peroxide	3 - 100mL beakers
10mL graduated cylinder	Ice
15 test tubes	Thermometer
Test tube rack	Triple Beam Balance
Petri Dish	Scalpel
Ruler	

**Procedure:**

Using the materials above, design an experiment that tests the effect of temperature on enzyme activity.

- Obtain chicken liver and materials from teacher.
- Measure and cut equal pieces of liver so that they will fit into the test tubes. Record the mass of each piece of liver.
- Put a piece of liver in first test tube and add 2 mL of hydrogen peroxide. Record the height of the oxygen bubbles produced. This will be the control test tube.
- Repeat for 5 trials.
- Put a piece of liver in second test tube, heat to desired temperature and record.
- Add 2 mL of hydrogen peroxide. Record the height of the oxygen bubbles produced.
- Repeat for 5 trials.
- Put a piece of liver into another test tube, cool to desired temperature and record.
- Add 2 mL of hydrogen peroxide. Record the height of the oxygen bubbles produced.
- Repeat for 5 trials.



Follow the tutorial to type your laboratory write up in Microsoft Word.

- Organize data into a data table.
- Graph the data.
- Design a graph using Microsoft Excel to depict the data table.
- Write a conclusion to the experiment.

**Extensions:**

Design an experiment that tests the effect of enzyme concentration, substrate concentration, or pH on enzyme activity.