

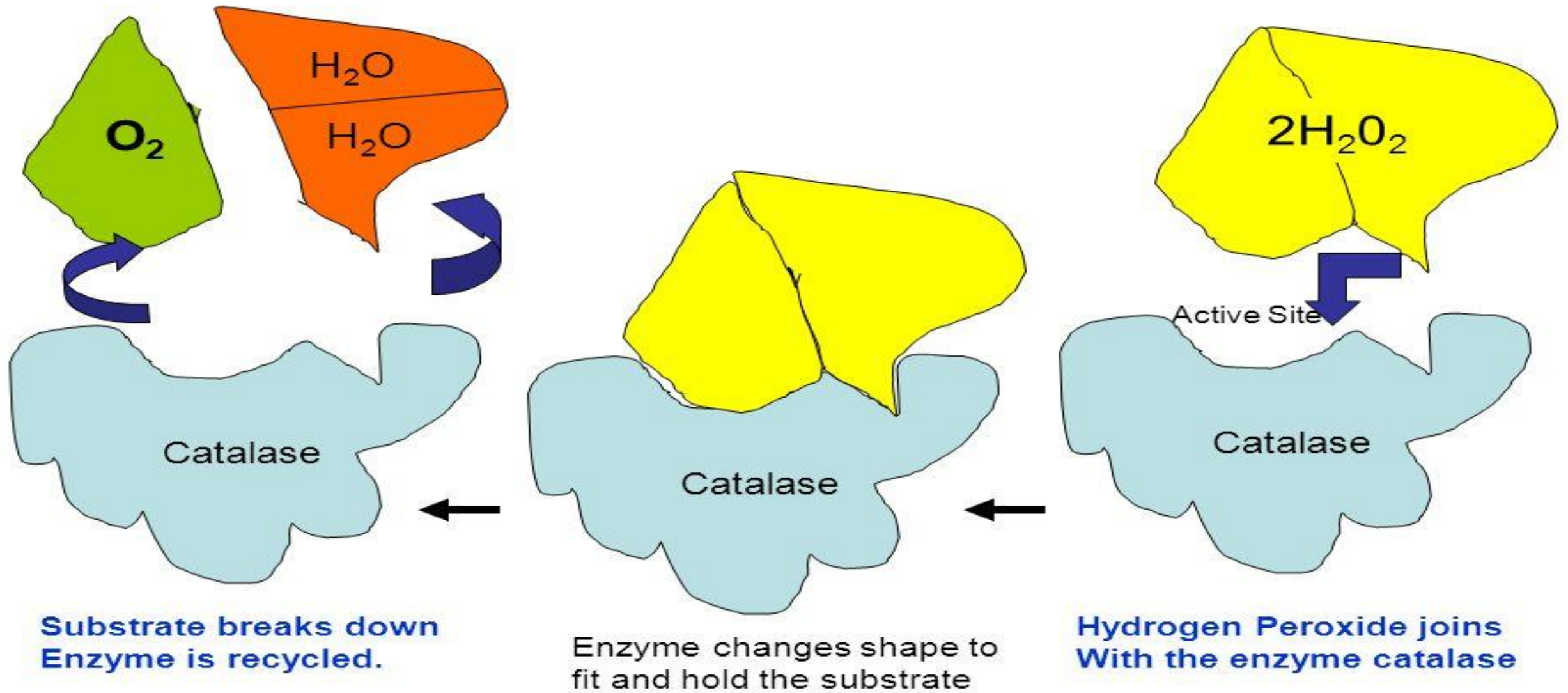
**AP Investigation 13:  
Effect of Various  
Factors on Enzyme  
Activity**

# Background

- Hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) → Toxic byproduct that must be removed from cells.
- Catalase (enzyme) breaks it up:  
$$2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$$
- Can be found in beef liver.

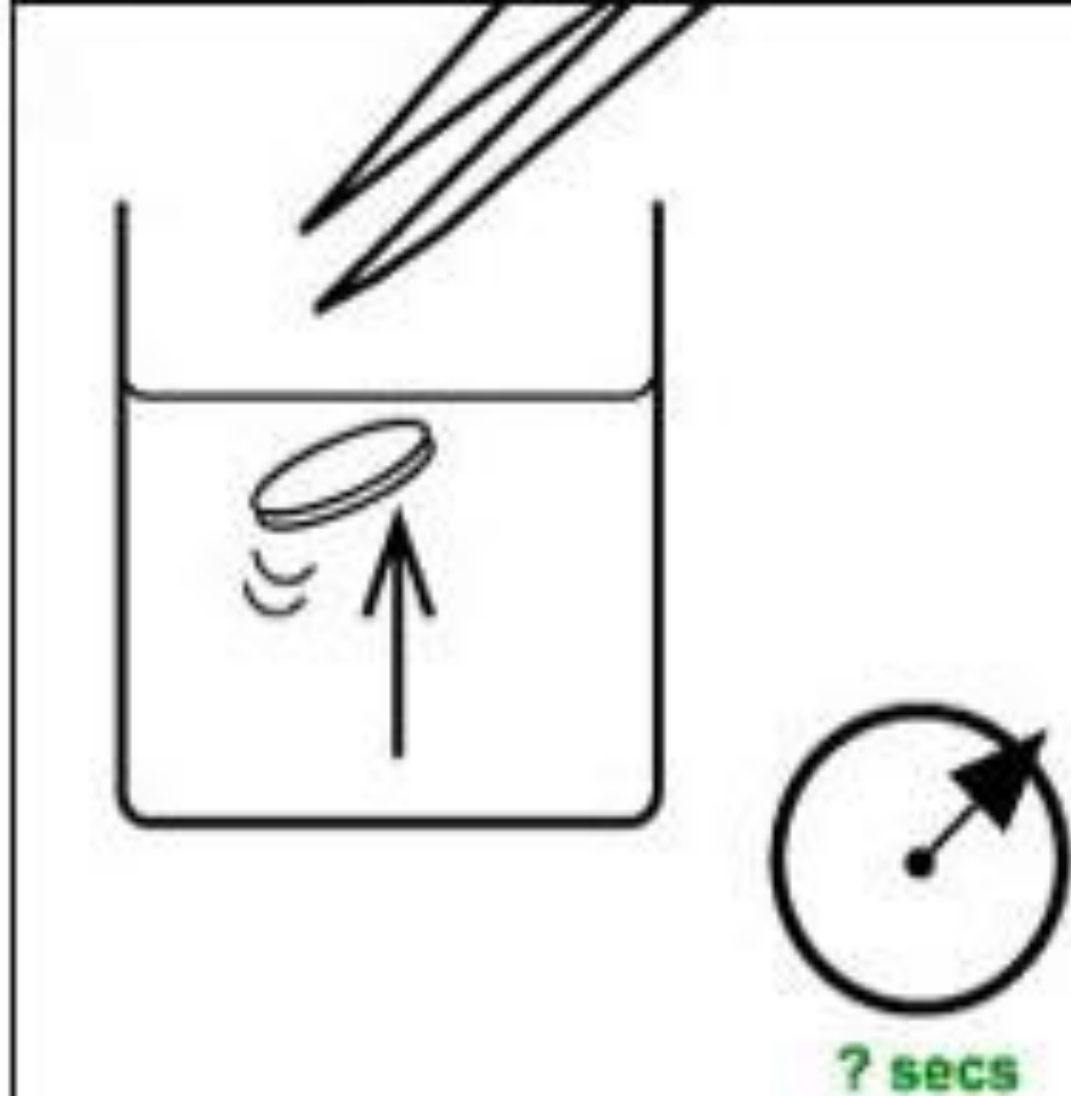
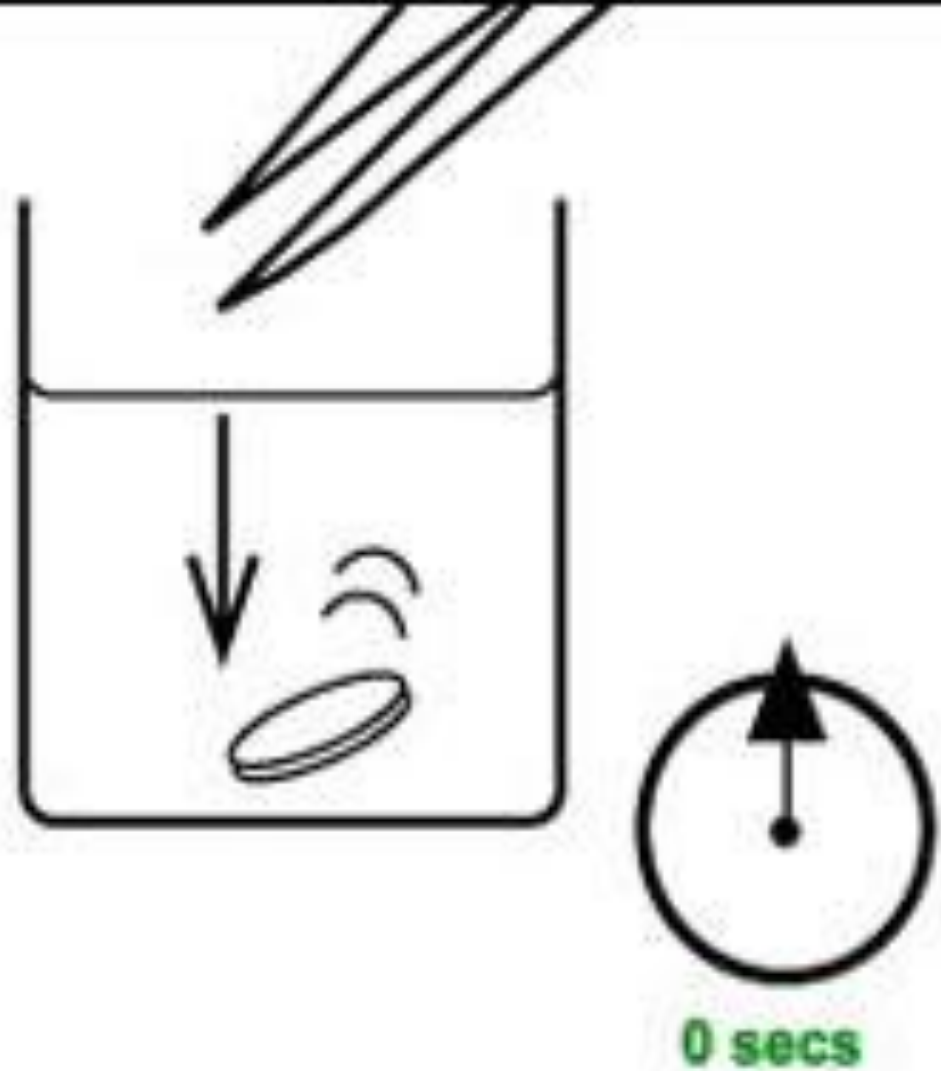


# Enzyme-Substrate Complex



# Part 1 General Directions

- Soak 4 filter paper discs in catalase solution.
- Then place in hydrogen peroxide (20 mL of 3% Hydrogen Peroxide).
- What gas will be given off (causing discs to rise?)
- Rate of enzyme activity is equal to the distance (depth of hydrogen peroxide in mm) divided by the time (in sec) for the disc to rise to the surface.



## Part 2 Inquiry Investigation

Use your baseline data for comparison to ask one of these questions:

1. What is the effect of enzyme concentration on enzyme activity?
2. What is the effect of substrate concentration on enzyme activity?
3. What is the effect of pH on enzyme activity?
4. What is the effect of temperature on enzyme activity?
5. Does the source of catalase affect enzyme activity?

# Investigation Begins!


- Design procedure, gather data, graph results, interpret and construct an argument.
- Be ready to present results!

**ARGUMENT PRESENTATION ON A WHITEBOARD**

The Guiding Question:

Our Claim: YOUR ANSWER TO THE GUIDING QUESTION

Our Evidence:



ANALYSIS  
SHOW A TREND, DIFFERENCE OR A RELATIONSHIP

Our Justification of the Evidence:

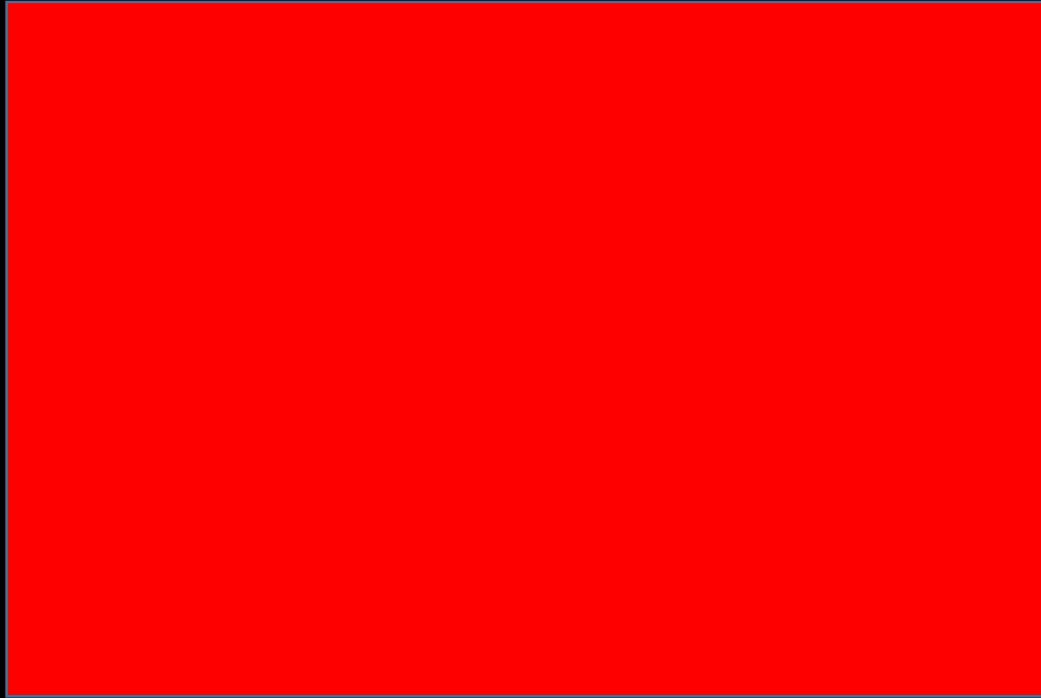
REASON  
EXPLAIN WHY THE EVIDENCE MATTERS

INTERPRETATION  
EXPLAIN WHAT THE ANALYSIS MEANS

This graph indicates...  
This graph shows...  
This graph suggests...

- We decided to use this evidence because...  
- This evidence is important because...  
- When we analyzed our data we assumed the following:

# Use Red/Green Cards For ASSiStance



**STOP! OUR GROUP HAS A  
QUESTION!!**



**OUR GROUP IS GOOD!**