

TxCETP Course Component: Alien Enzyme Function

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I. Introduction

Overview:

This inquiry-based lab module is designed to give students practical experience designing experiments in an investigative manner while also teaching valuable content knowledge concerning enzyme function and chemical digestion and developing their communication skills. Students are given unknown enzymes and must determine what substrate, pH, and temperature allow the enzymes to work best. They must also explain the “how and why” of their results. Connections are made not only to TEKS, but also to the National Science Education Standards (National Research Council, 1996). You can use this module before or after a unit on digestion/enzymatic function. You may modify as you wish to fit your individual course needs.

Prerequisites:

Prior to this lab students should have an understanding of the following concepts: human digestive anatomy and physiology, an overview enzyme function and metabolism, and experimental design.

Objectives:

The student should be able to:

- explain how enzymes function,
- predict the effect of substrate, pH, and temperature on enzyme structure and activity,
- name 3 characteristics of enzymes and explain how they function in degradation reactions,
- describe the function of bile in digestion, and
- explain how temperature and pH differences affect enzyme activity.

Connections to TEKS:

112.43: B1; C1, A&B; C2, A-D; C3, A; C4, B; C9, A&C

Connections to NSES:

Teaching Standards (B), (D), & (E); Content Standard A

Instructional Game Plan:

This is a group project designed to be used in a biology laboratory for high school students. Students may work in groups of 2-4.

Estimated Time:

Approximately 4 hours. Students will need a period to plan their experiment and another to execute it in the lab setting.

Activities:

Students must complete a pre-lab assignment concerning digestive anatomy and physiology, plan and design an experiment to investigate enzyme function as related to digestion, and compile a report that summarizes their findings.