

# How Do Enzymes Help with Lactose Intolerance?

Lactose intolerance is an inability to digest lactose, a sugar found in milk and other dairy products. More than two-thirds of adults suffer from lactose intolerance, which can cause symptoms including abdominal pain, gas, nausea, and diarrhea after dairy products are consumed. Supplements have been developed to assist those with lactose intolerance—but how do these supplements work?

## 1. ASK A QUESTION

With your team, define the specific question to be answered. Identify all of the factors you will explore to answer the question and the characteristics a complete answer should have.

## 2. PLAN AND CARRY OUT AN INVESTIGATION

With your team, design and carry out an experiment to determine the effect of lactose intolerance supplement tablets on milk.

 **Hands-On Lab** Explore Online 

### Digesting Milk

Use glucose test strips to determine the presence and amount of glucose in the milk. What differences do you expect to see between milk alone and milk treated with the tablets?

## 3. ANALYZE DATA

On your own, analyze the question you've defined along with your research. Can you characterize the effect the tablets have on the milk? How does this relate to the condition of lactose intolerance in humans? What might be the connection?

## 4. CONDUCT RESEARCH

On your own, research the structure of lactose, how it breaks down in the body, how lactose intolerance arises, and what the supplement tablets have in common with the normal digestive process. How does this information correlate with your experimental findings?

## 5. COMMUNICATE

Write a report explaining how the lactose intolerance supplement tablets work, why some people require these or similar pills, and how lactose is broken down. Present your report and relate your findings to what you have learned about chemical reactions, rearrangement of atoms, breaking of chemical bonds, and the formation of new products.



## CHECK YOUR WORK

**A complete presentation should include the following information:**

- a clearly defined problem with supporting questions that are answered in the final presentation
- a summary of experimental results, based on observations
- a solution describing the mechanism of lactose breakdown, the specific deficiency in lactose intolerance, and the way in which the supplement tablets counteract symptoms in lactose-intolerant people