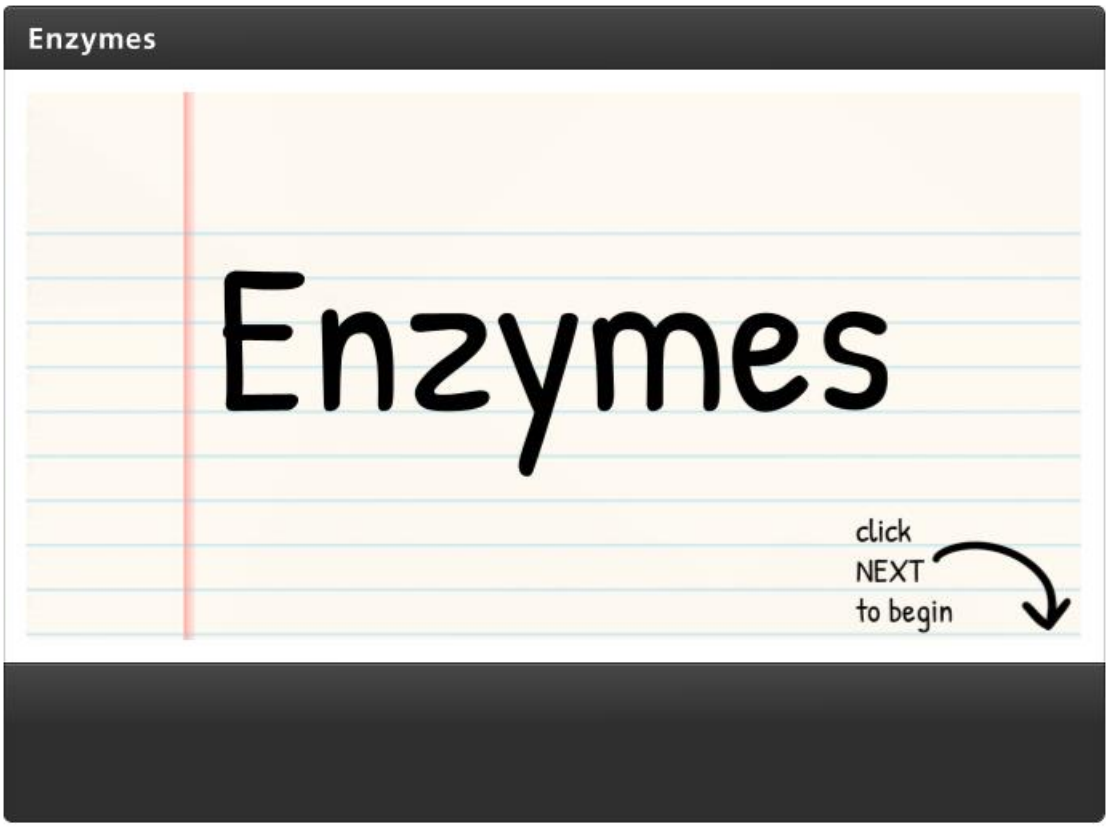
Module 2: Biochemistry
Topic 4 Content: Enzymes Notes



Enzymes

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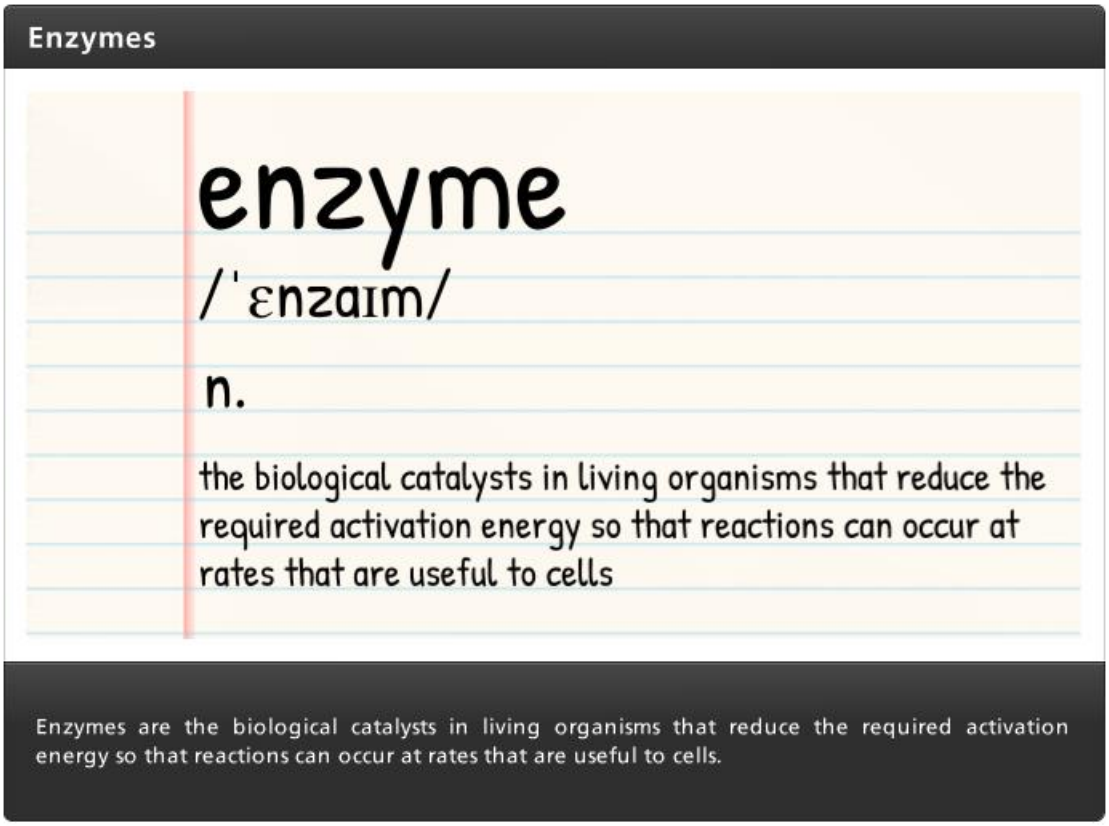

Enzymes are the biological catalysts in living organisms that reduce the required activation energy so that reactions can occur at rates that are useful to cells.

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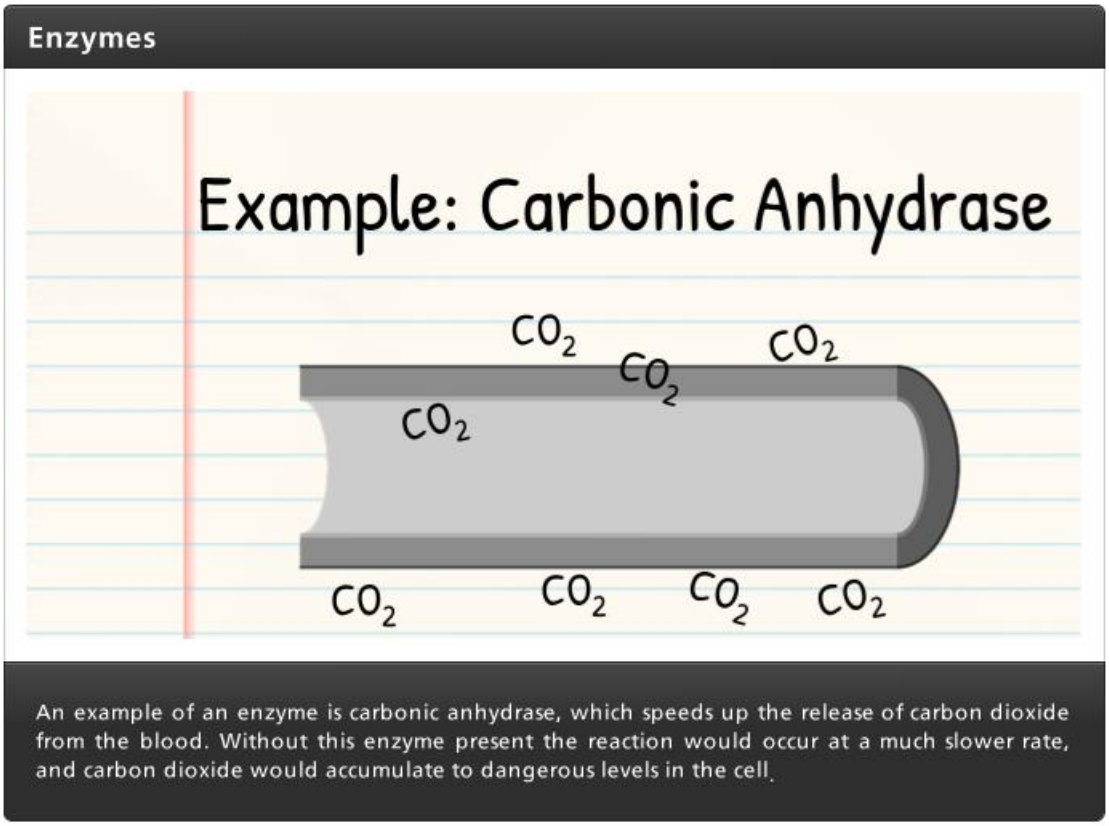

An example of an enzyme is carbonic anhydrase, which speeds up the release of carbon dioxide from the blood. Without this enzyme present the reaction would occur at a much slower rate, and carbon dioxide would accumulate to dangerous levels in the cell.

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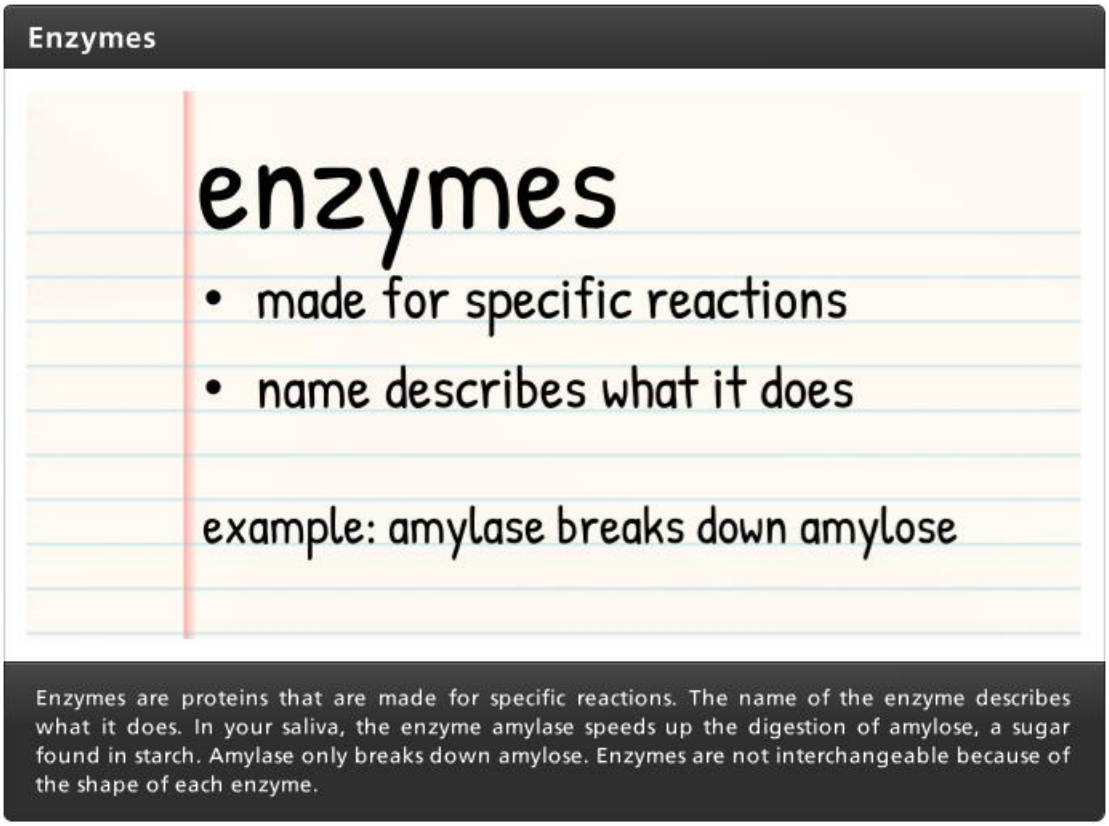

Enzymes are proteins that are made for specific reactions. The name of the enzyme describes what it does. In your saliva, the enzyme amylase speeds up the digestion of amylose, a sugar found in starch. Amylase only breaks down amylose. Enzymes are not interchangeable because of the shape of each enzyme.

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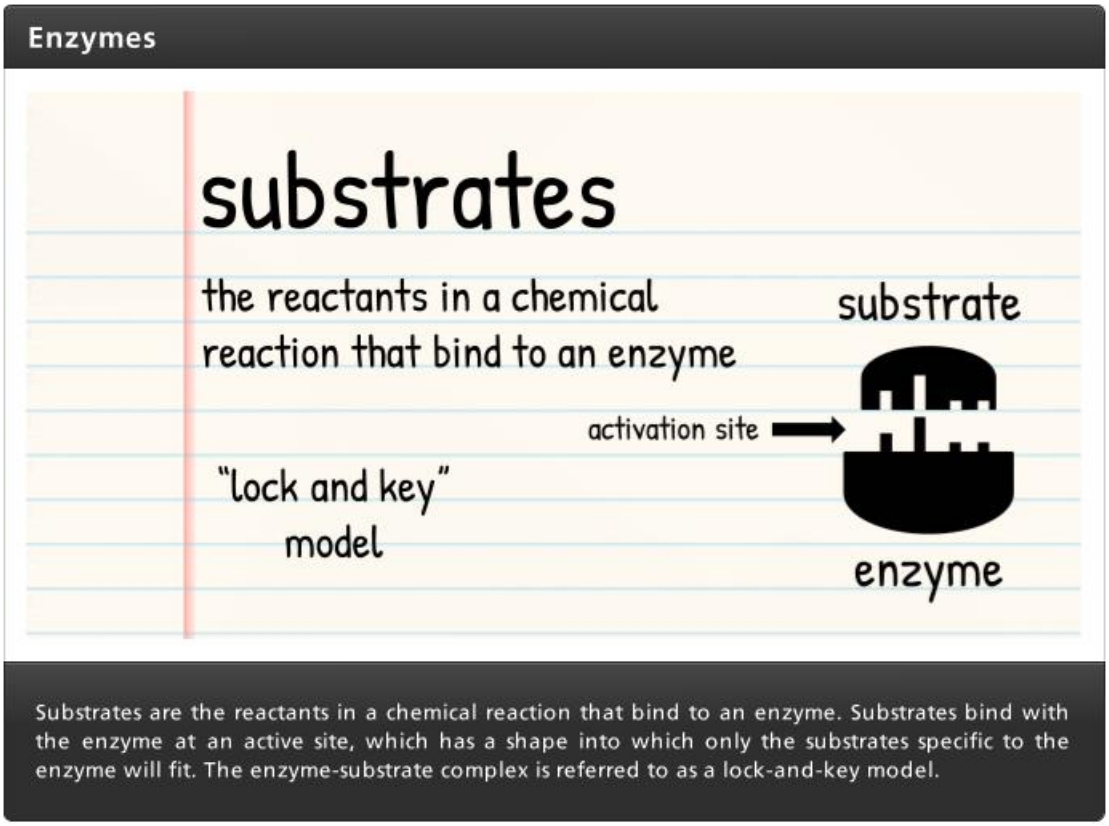
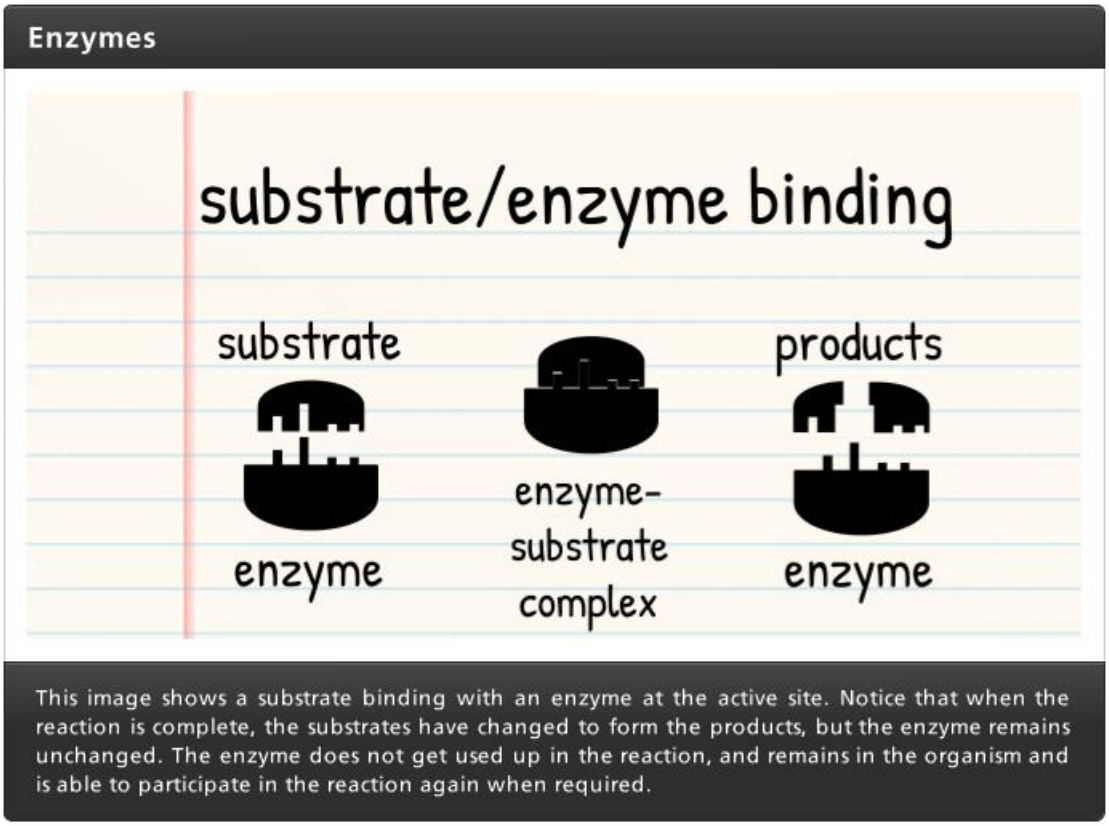


Substrates are the reactants in a chemical reaction that bind to an enzyme. Substrates bind with the enzyme at an active site, which has a shape into which only the substrates specific to the enzyme will fit. The enzyme-substrate complex is referred to as a lock-and-key model.



This image shows a substrate binding with an enzyme at the active site. Notice that when the reaction is complete, the substrates have changed to form the products, but the enzyme remains unchanged. The enzyme does not get used up in the reaction, and remains in the organism and is able to participate in the reaction again when required.