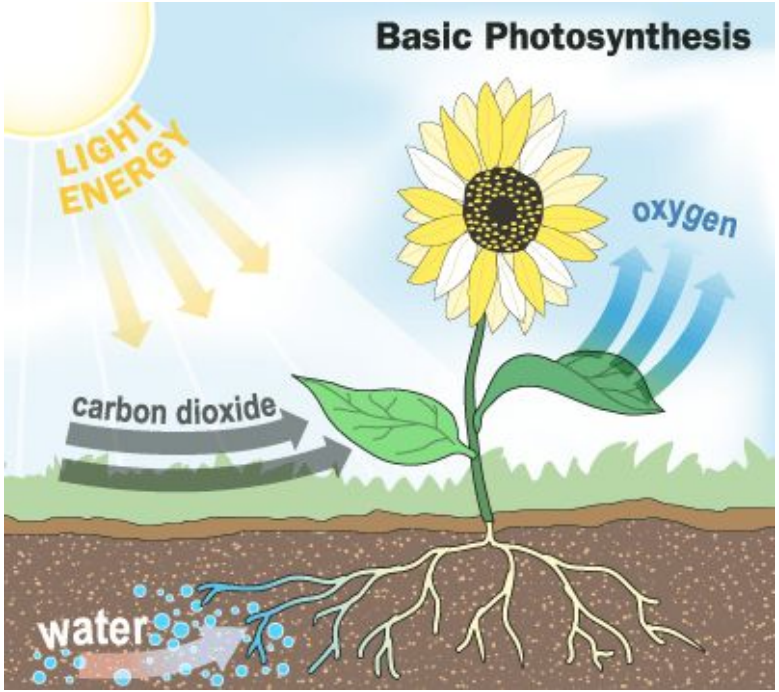
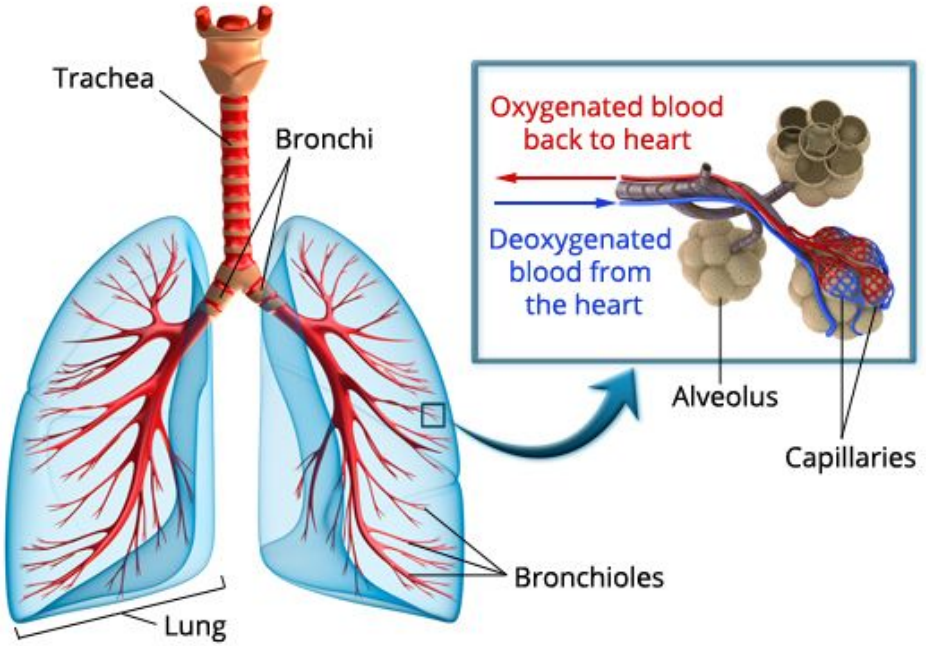
Living organisms carry out chemical reactions to stay alive

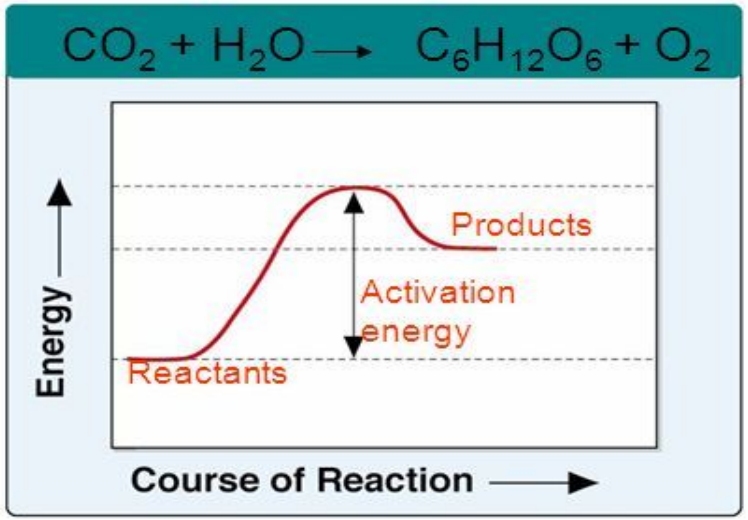
Energy is released or absorbed when a chemical reaction occurs.





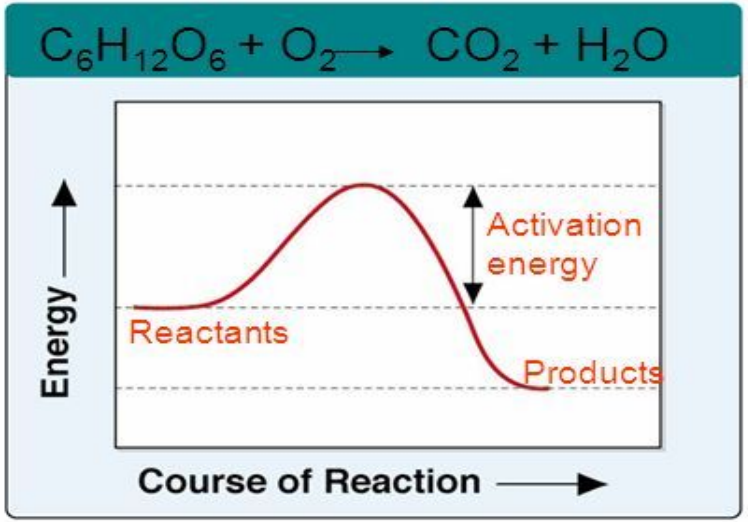
Activation energy: the energy that is needed to start a chemical reaction

Energy-Absorbing Reaction



Example – Photosynthesis (synthesis)

Energy-Releasing Reaction



Example – Cell Respiration (decomposition)

Endergonic:
"uphill" reaction, requires activation energy, absorbs energy

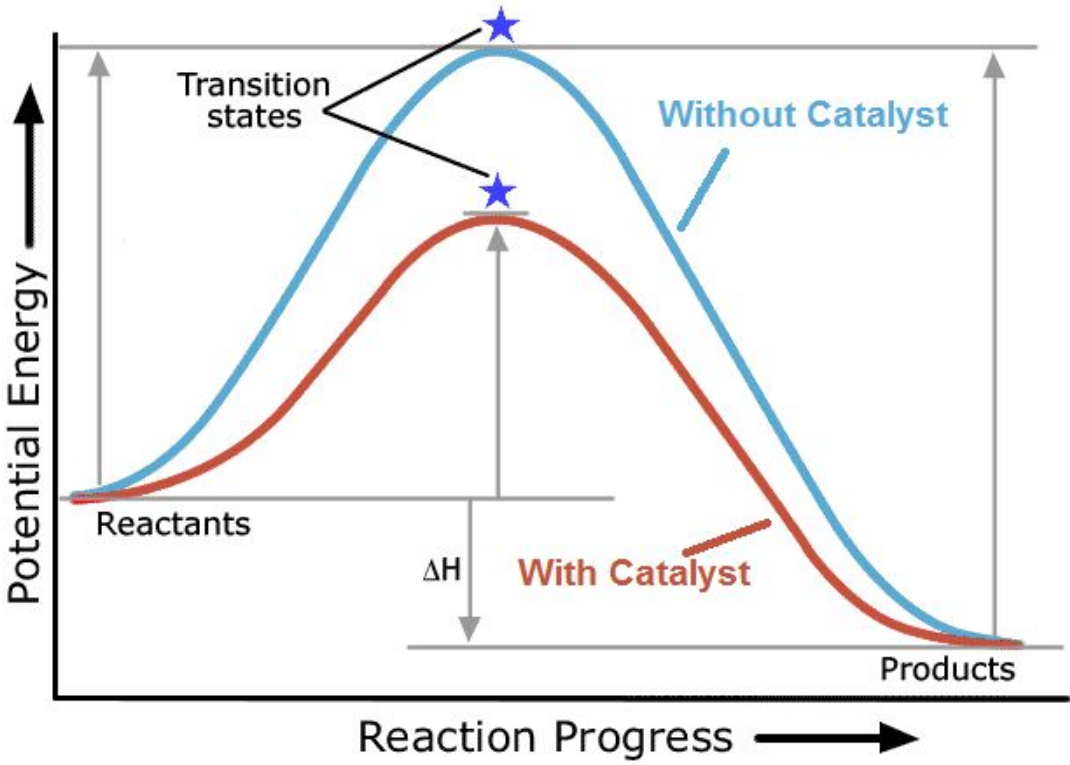
Exergonic:
"Downhill" reaction, spontaneous, releases energy

Some reactions in life are too slow, therefore cells make catalysts.

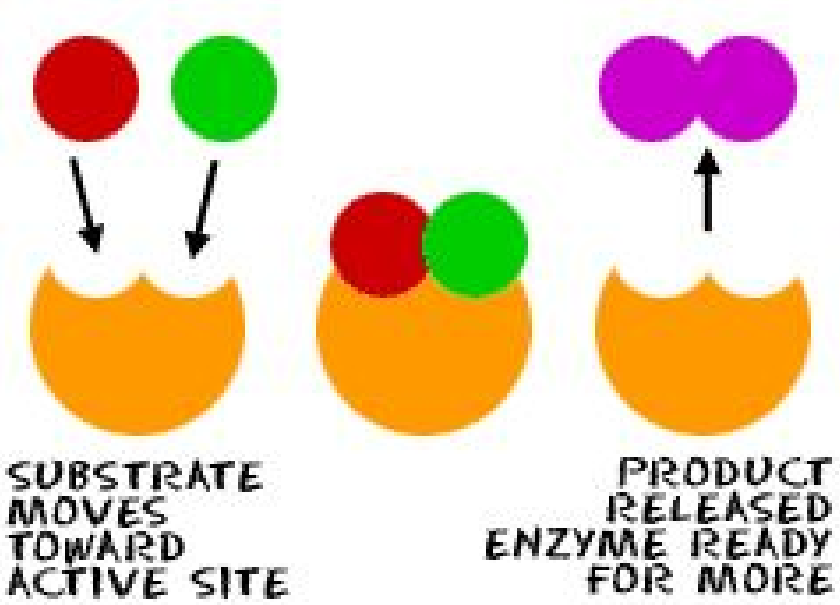
Catalyst: a substance that speeds up the rate of a reaction.

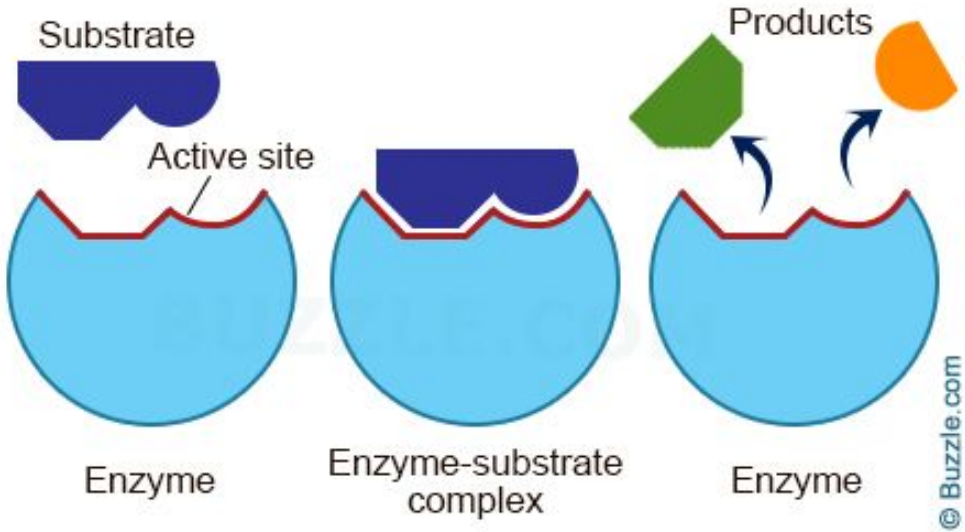
- Lower the activation energy required

Enzymes: *proteins* that act as biological catalysts.



Substrates: *reactants* in an enzyme-catalyzed reaction





[Your favorite cartoon biologists to explain enzymes]