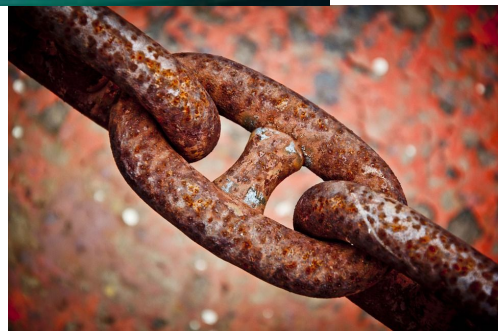
Review Biomolecules

2.4 Chemical Reactions & Enzymes

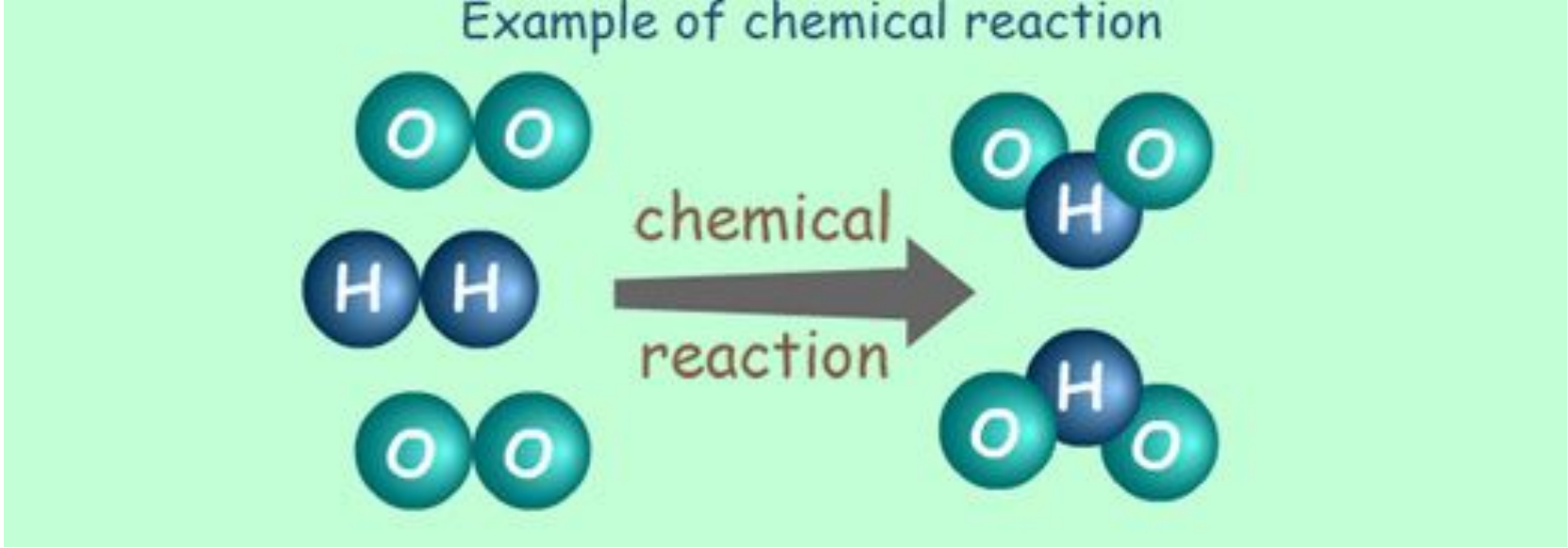
Chemical reaction: a process that changes, or transforms one set of chemicals into another.



- Bonds are broken, new chemical bonds form
- Can occur quickly or slowly
- **Involve changes in energy**

5 ways to tell if a chemical reaction has occurred:

- Emission of heat or light
- Gas is produced
- Color change observed
- Formation of a precipitate
- Odor is produced



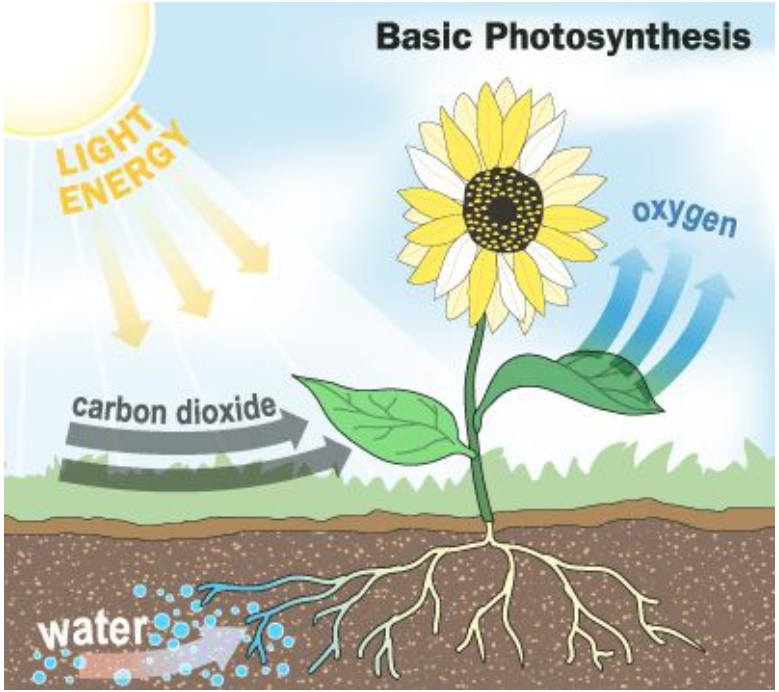
Reactants → **Products**

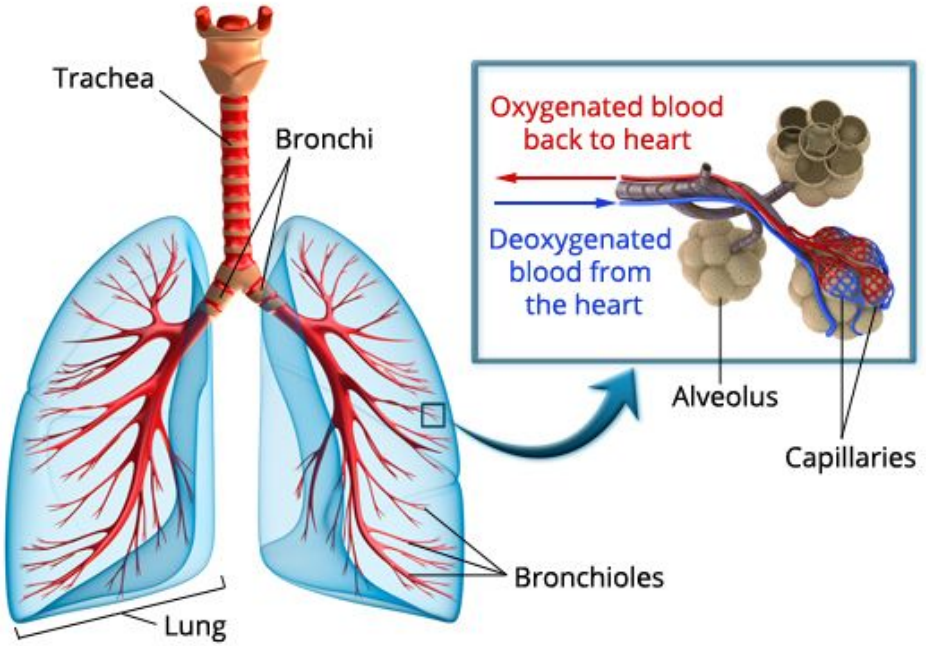
Reactants: elements or compounds before a reaction takes place

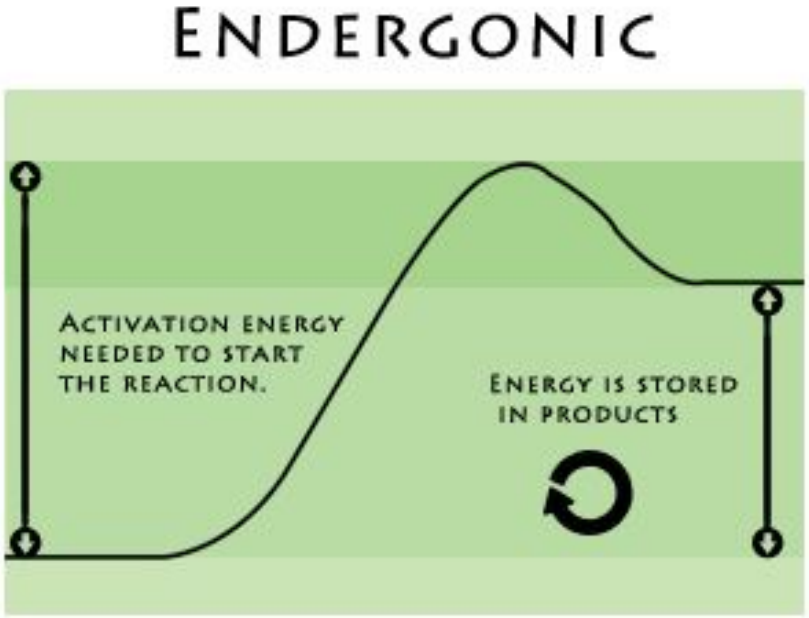
Products: elements or compounds that are formed after a reaction takes place

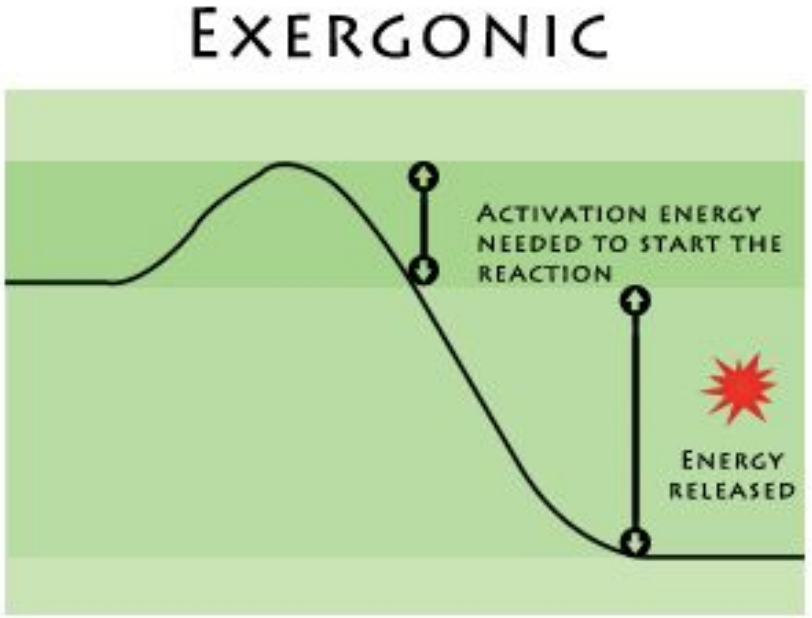
Living organisms carry out chemical reactions to stay alive

Energy is **released** or **absorbed** when a chemical reaction occurs.









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

Exergonic:
"Downhill" reaction, spontaneous, releases energy

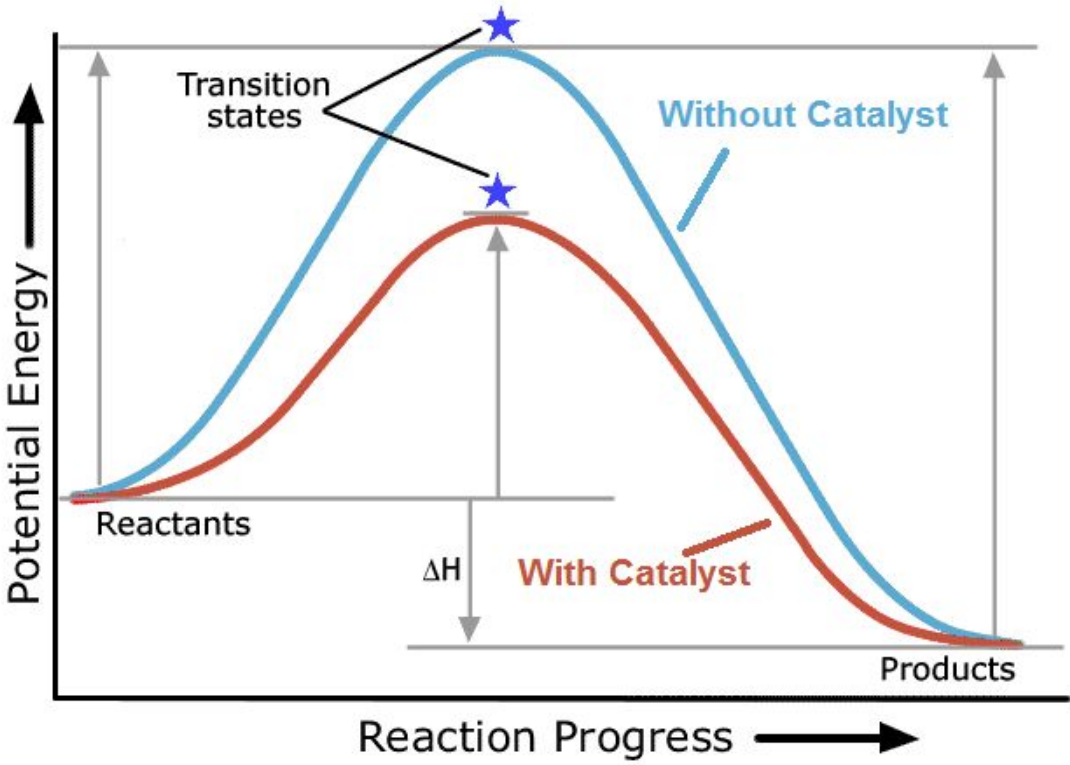
Activation energy: the energy that is needed to start a chemical reaction

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

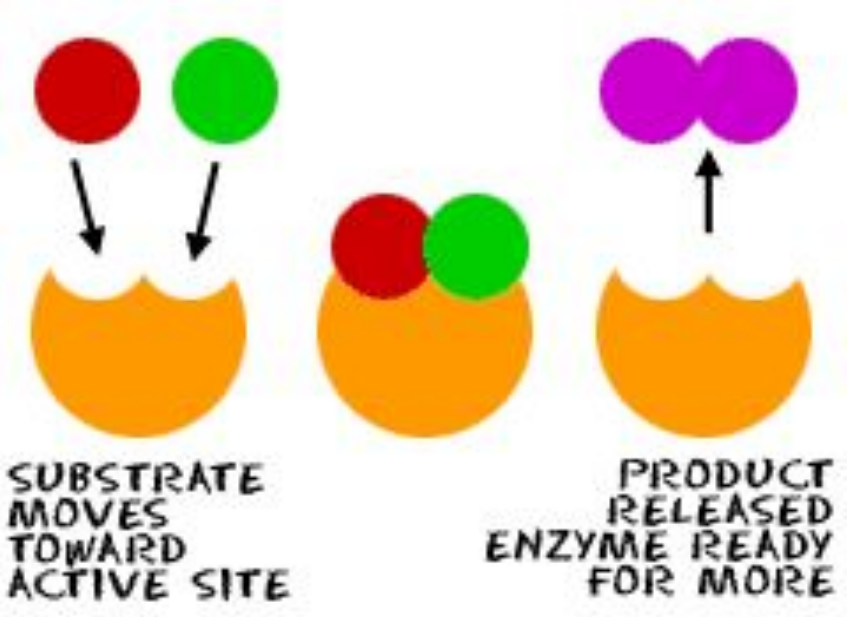
Catalyst: a substance that speeds up the rate of a reaction.

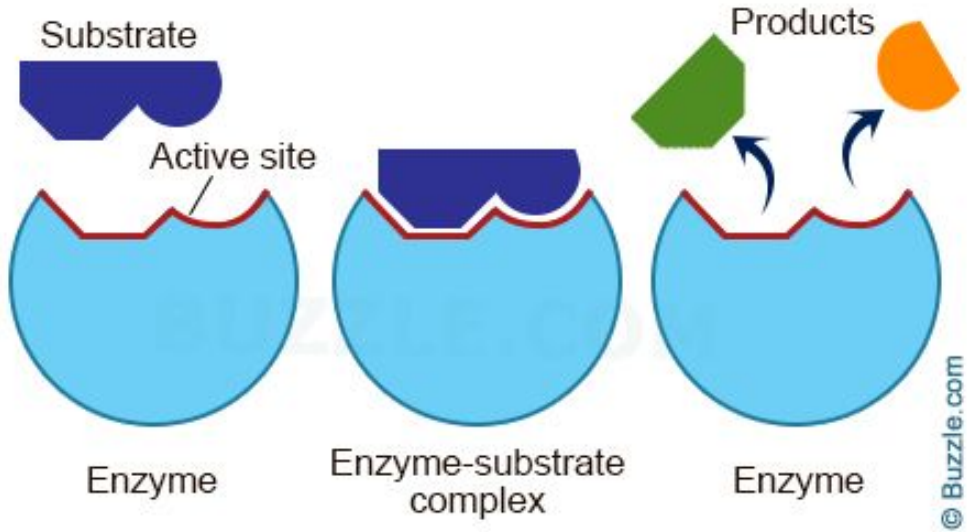
- Lower the activation energy required

Enzymes: *proteins* that act as biological catalysts.



Substrates: *reactants* in an enzyme-catalyzed reaction





Your favorite cartoon biologists to explain enzymes