- Enzymes are proteins with a long chain of amino acids and very specific three-dimensional shape
- They have an area that is designed to match a specific molecule known as *substrate*
    - This area is called *active site*
    - Analogy for enzyme-substrate activity is a lock and key
        - The lock represents the active site and the key the substrate
        - Because the three-dimensional shape of the internal portion of the lock is complex and specific only one key will fit
- The substrate must enter with a minimum rate of motion that will provide enough energy for the reaction to occur
    - This energy is called *activation energy* and it is not provided by the enzymes
        - Enzymes just lower the minimum energy that is required
- Enzymes are not reactants and therefore they are not used up in the reaction
    - Enzymes act like catalysts and they can be used many times
        - A *catalyst* increases the rate of reaction without being consumed
- An enzyme cannot force a reaction that would not happen without the enzyme's presence to occur
- The reaction may be more likely to occur with an enzyme present, as the activation energy will be lower

Enzyme-catalysed reactions - factors

- All chemical reactions are fundamentally molecules colliding
    - At a high enough rate of speed, if the molecules are capable of reacting with each other, there is a chance that a reaction will occur
    - Enzymes cannot change these fundamentals
- There are many factors that affect the rate of an enzyme-catalyzed reaction
    - Temperature
        - The rate of the motions of the enzyme and the substrate are dependent on the temperature of the fluid in which they move
        - The higher the temperature of the fluid, the faster the molecules move and the faster the molecules move, the more often they collide
            - Reactions with or without enzymes will increase their reaction rate as the temperature rises
        - Reactions that use enzymes have an upper limit, which is based on the temperature at which the enzyme begins to lose its shape