Chemical Reactions

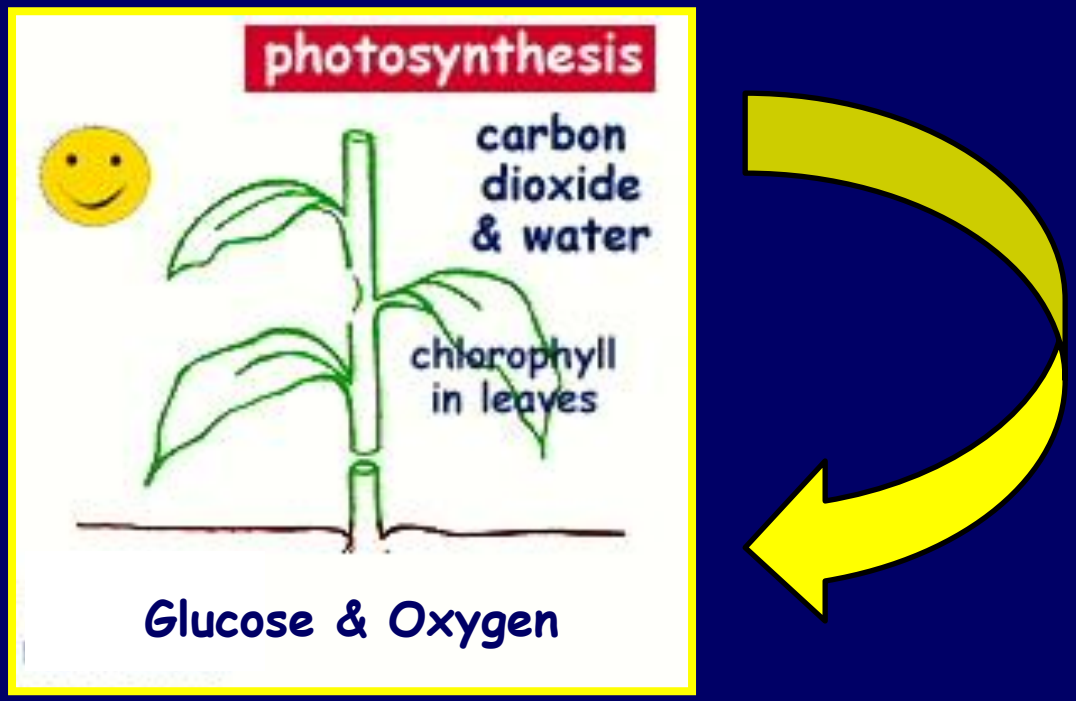
I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can identify reactants and products in a chemical equation
- I can distinguish between exergonic and endergonic reactions.
- I can explain how catalysts help reactions.
- I can list 5 different indications that a chemical change has take place.

Chemical Reactions

Chemical Reactions are a chemical change in which one or more substances are converted into new substances



Reactants

Chemical reactions are expressed as chemical equations.

$CO_2 + H_2O$ → $C_6H_{12}O_6 + O_2$

Reactants **Products**

Reactants are the substances that react together during the reaction.

Products

Products are the substances produced during the reaction.

$CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$

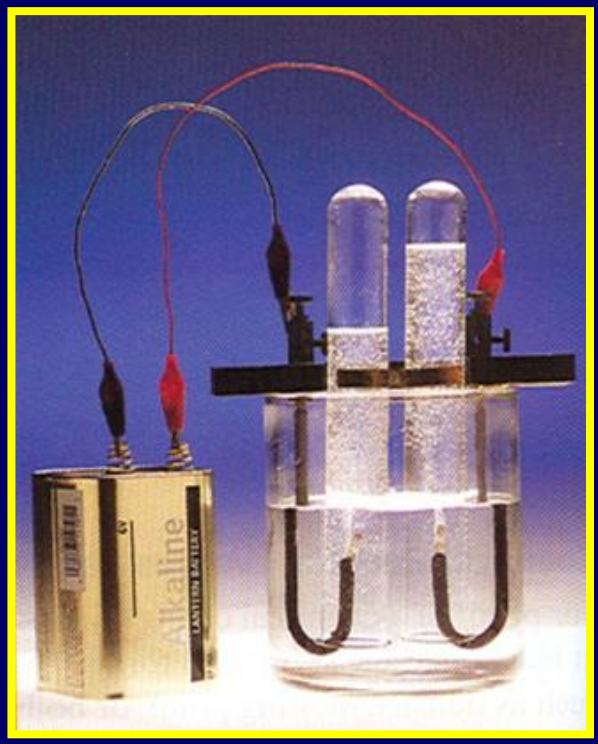
Reactants **Products**

The arrow indicates the direction of the reaction.

Endergonic Reactions

Some chemical reactions require an input of energy to take place.

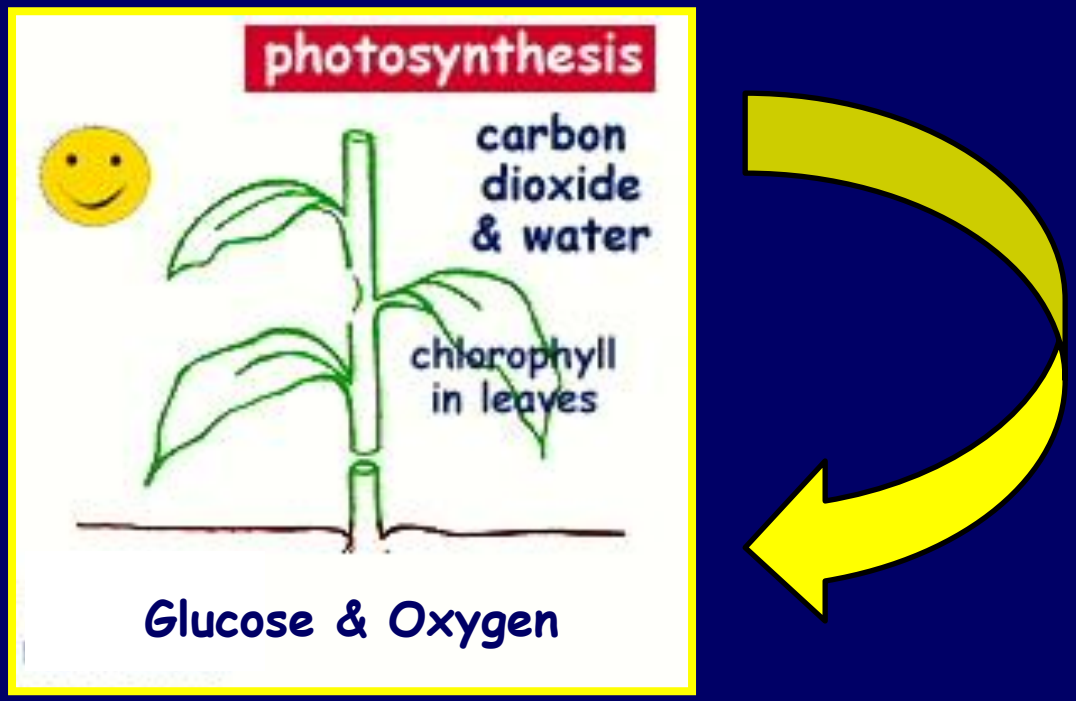
The splitting of water into oxygen and hydrogen gas requires electricity



Chemical reactions that require energy to take place called endergonic reactions.

Photosynthesis

Photosynthesis is an endergonic reaction because it requires energy from sunlight, in order to take place.



Endothermic Reactions

Some chemical reactions require an input of heat before they will take place.

Baking requires heat before the chemical reactions will occur that will result in a cake.

Chemical reactions that require heat to take place called endothermic reactions.

Exergonic Reactions

Some chemical reactions release energy in the form of light, as they take place.

Fireworks release different colored lights, depending upon the types of chemicals involved.

Chemical reactions that release energy in the form of light are called exergonic reactions.

Exothermic Reactions

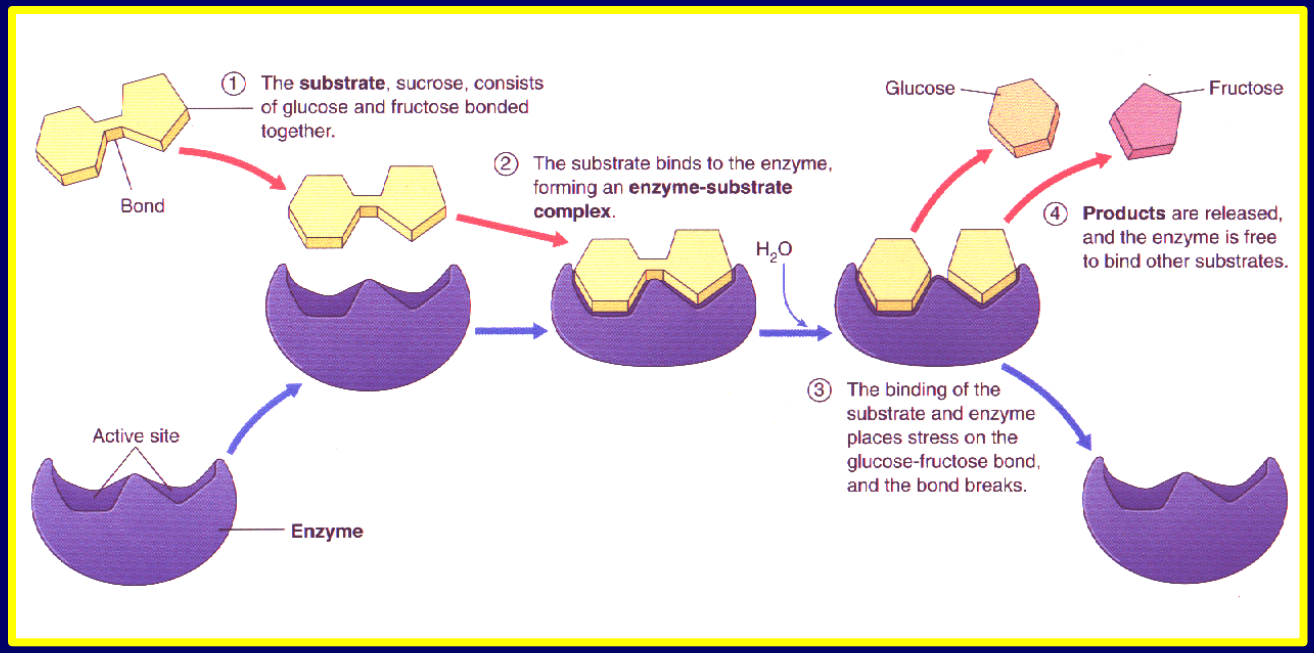
Some chemical reactions release heat as they take place.

Fire is a chemical reaction that releases heat.

Chemical reactions that release energy in the form of heat are called exothermic reactions.

Catalyst

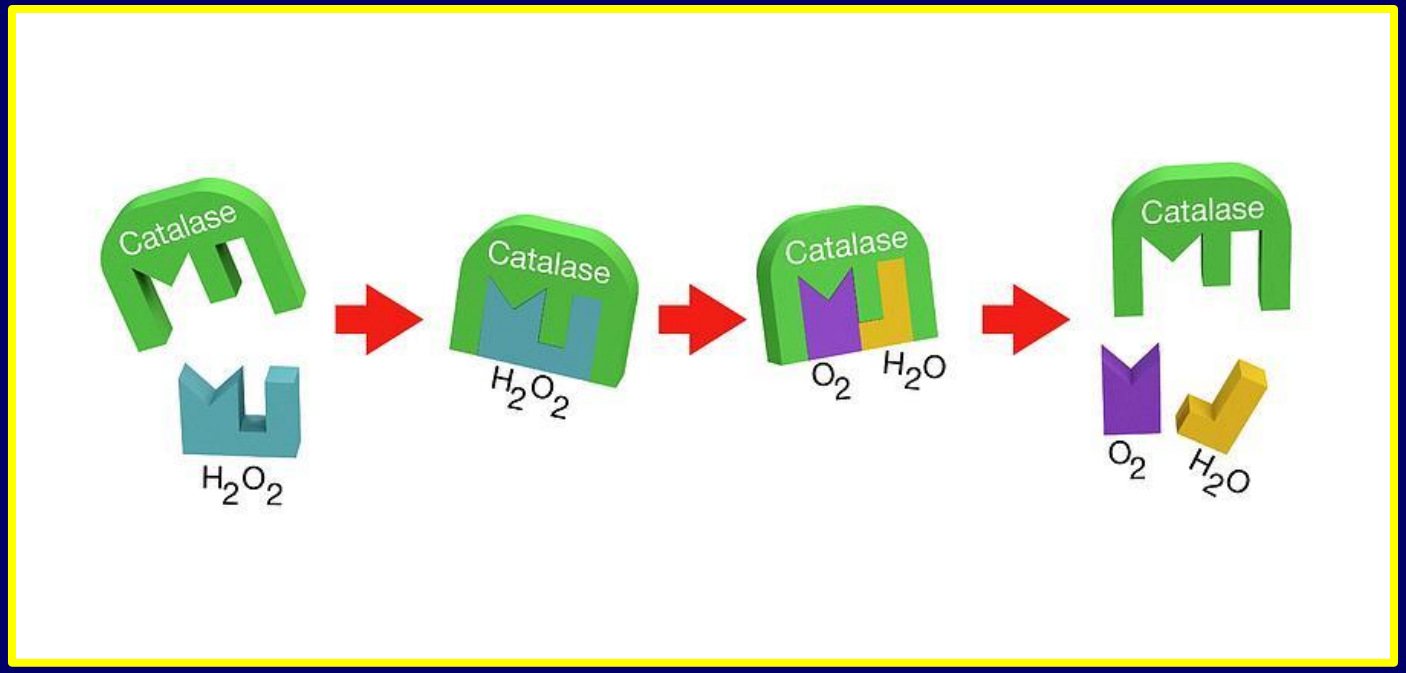
Catalysts are substances that speed up chemical reactions without being changed themselves.



Enzymes are proteins that act as catalysts during biochemical reactions.

Catalase Enzyme

Catalase is a protein enzyme found in most living organisms and is an important catalyst because it helps break down hydrogen peroxide, H_2O_2, that forms naturally inside of cells.



Indicators of Chemical Change

There are five basic indicators that a chemical reaction has taken place.

A change in temperature, either colder or warmer, indicates a chemical change has taken place.

Indicators of Chemical Change

A change in color in the substance indicates a chemical change has taken place.

Indicators of Chemical Change

A change in odor of the substance indicates a chemical change has taken place.

Indicators of Chemical Change

The formation of gas or bubbles indicates a chemical change has taken place.

Indicators of Chemical Change

The formation of a precipitate indicates a chemical change has taken place.

The End